

NATHAN P. LEMOINE

ASSISTANT PROFESSOR – MARQUETTE UNIVERSITY



+1 414-288-1482



nathan.lemoine@marquette.edu



Milwaukee, WI



www.natelemoine.com



EDUCATION

- 2015 **PhD – Biology**
Florida International University
Miami, FL
- 2010 **MSc – Marine Science**
Dauphin Island Sea Lab
Mobile, AL
- 2006 **BSc – Biology & Environmental Studies**
University of Richmond
Richmond, VA



PROFESSIONAL APPOINTMENTS

- 2019 – present **Assistant Professor of Trophic and Quantitative Ecology**
Department of Biological Sciences
Marquette University
Milwaukee, WI
- 2019 – present **Adjunct Curator of Zoology**
Department of Zoology
Milwaukee Public Museum
Milwaukee, WI
- 2021 – present **Early Career Fellow**
Ecological Society of America
- 2016 – 2017 **Adjunct Faculty**
Department of Ecology and Evolutionary Biology
University of Colorado at Boulder
Boulder, CO
- 2015 – 2019 **Research Scientist**
Department of Biology
Colorado State University
Fort Collins, CO

2014	Visiting Scientist National Institute for Mathematical and Biological Synthesis University of Tennessee Knoxville, TN
2013 – 2014	Predocctoral Fellow Smithsonian Environmental Research Center Edgewater, MD
2010 – 2013	Presidential Fellow Florida International University Miami, FL
2007 – 2010	Graduate Research Fellow Dauphin Island Sea Lab Mobile, AL

 **GRANTS (PAST: \$426,898 CURRENT: \$1,345,028)**

Current	NSF DEB Ecosystems 2120894 \$460,049 <i>Collaborative Research: Ecological legacy effects of megacarcasses in African savanna ecosystems. Lead PI: Deron Burkepille (UCSB); Co-PI: Johann du Toit (USU); Co-PI: Joshua Schimel (UCSB); Co-PI: Aimee Tallian (USU). Total award amount: \$1,346,943</i>
Current	NSF DEB Ecosystems 1754124 \$884,979 <i>Predicting the effects of extreme drought on insect herbivore control of grassland ecosystem function. Transferred to Marquette under NSF DEB Ecosystem 1941390</i>
2015 – 2018	USDA NIFA-AFRI Postdoctoral Fellowship \$149,704 <i>Predicting the effects of increased climate variability on consumer regulation of ecosystem function in US grasslands</i>
2015	NIMBioS Postdoctoral Fellowship \$107,000 <i>A new statistical framework for assessing community assembly mechanisms. Offered by declined.</i>
2014	FIU Dissertation Year Fellowship \$16,600
2014	FIU Dissertation Evidence Acquisition Grant \$8,300
2013	Smithsonian Graduate Research Fellowship \$15,500 <i>Will global change disrupt trophic transfer in marsh ecosystems?</i>
2013 – 2015	NSF Doctoral Dissertation Improvement Grant \$15,294 <i>Assessing the effects of climate change on biotic interactions structuring plant-herbivore communities.</i>
2010 – 2013	FIU Presidential Fellowship \$75,000
2007 – 2010	USA Graduate Fellowship \$32,000

2007	DISL Exxon-Mobile Fellowship	\$2,000
2005	UR Student Travel Grant	\$1,000
2005	UR Robert F. Smart Fellowship	\$4,000
2005	UR Research Grant	\$500

 **OTHER CONTRIBUTIONS (CURRENT: \$2,000)**

Other contributions are those projects on which I am not a PI or Co-PI, but am a formal contributor.

Current	NSF MCB 2127616 <i>Spatial and temporal mechanisms underlying aggregate formation. My role – modeling protein aggregate spatial movement from microscopy images; supporting scientist. Lead PI: Anita Manogaran (MU). Total award amount: \$950,000</i>	\$2,000
---------	---	----------------

 **PUBLICATIONS (PUBLISHED: 44 FIRST AUTHOR: 21 IN PRESS: 2)**

* denotes undergraduate researcher

In Prep	Lemoine NP , BJ Adams, M Diaz, NB Dragone, ALC Franco, N Fierer, WB Lyons, ID Hogg, DH Wall. Community assembly of Antarctic soil microbial communities in unvegetated habitats reveals strong dispersal limitation. Target: mBio
	Hoffman AM, TW Ocheltree, NP Lemoine . Metabolome and physiology reveal distinct nitrogen addition effects on dominant species in a semi-arid grassland.
	Gupstra CGB, NP Lemoine , C Cook, AMS Correa. Thank you for biting: dispersal of beneficial microbiota through ‘antagonistic’ interactions. Invited Review: Trends in Microbiology
Submitted	Lemoine NP , ML Budny. Seasonal soil moisture variability, not drought, drives differences in photosynthetic physiology of two C ₄ grass species. Plant Ecology
	Lemoine NP , ML Budny. Palatability does not predict photosynthetic overcompensation to simulated herbivory. The American Midland Naturalist
	Lemoine NP . Phenology dictates the importance of climate change on geographic distributions of six co-occurring North American grasshoppers. Ecology and Evolution
	Franco ALC, BJ Adams, M Diaz, NP Lemoine , N Dragone, N Fierer, WB Lyons, ID Hogg, DH Wall. Responses of Antarctic soil fauna to climate-drive changes since the Last Glacial Maximum. Global Change Biology
In Revision	Budny ML, NP Lemoine . An accurate, portable, and relatively inexpensive method for quantifying microbial respiration. Methods in Ecology and Evolution

- In Press Crump M^{*}, C Brown^{*}, RJ Griffin-Nolan, L Angeloni, **NP Lemoine**, B Seymoure. Effects of low-level artificial light at night (ALAN) on interactions and related biology of the house cricket (*Acheta domestica*) and Kentucky bluegrass (*Poa pratensis*). **Frontiers in Ecology and Evolution**
- Xu C, Y Ke, L Li, MD Smith, **NP Lemoine**, W Zhang, Q Yu. Herbivores alleviate the negative effects of extreme drought on plant communities by enhancing dominant species in an Inner Mongolian grassland. **Journal of Plant Ecology**
- 2021 **Lemoine NP**. Unifying ecosystem resistance, resilience, recovery, and lag effects from extreme stress into a single statistical framework. **Oikos** 130:408-421
- 2020 Avolio ML, KR Wilcox, KJ Komatsu, **NP Lemoine**, W Bowman, SL Collins, AK Knapp, SE Koerner, MD Smith, S Baer, KL Gross, F Isbell, J McLaren, P Reich, K Suding, KB Suttle, D Tilman, Z Xu, Q Yu. Temporal variability in production is not consistently affected by global change drivers across herbaceous-dominated systems. **Oecologia** 194:735-744
- Parker JD, JL Devaney, **NP Lemoine**. Biotic resistance to plant invasions. In: Traveset A, Richardson DM (eds) **Plant Invasions: The Role of Biotic Interactions**. CABI. Oxfordshire, UK. Pp: 177-191
- Rice MM, RL Maher, AMS Correa, HV Moeller, **NP Lemoine**, AA Shantz, DE Burkepille, NJ Silbiger. Macroborer presence promotes parrotfish corallivory, particularly under increased nutrient output. **Coral Reefs** 39:409-418
- Wilcox KR, KJ Komatsu, ML Avolio, WD Bowman, E Butler, SL Collins, JS Dukes, R Fisher, TF Keenan, NY Kiang, AK Knapp, SE Koerner, LM Kueppers, **NP Lemoine**, G Kiang, ME Loik, Y Luo, B Poulter, PB Reich, K Renwick, MD Smith, A Tredennick, AP Walker. Improving collaborations between empiricists and modelers to advance grassland community dynamics in ecosystem models. **New Phytologist** 228:1467-1471
- Zaspel JM, JM Allen, CD Tyrrell, **NP Lemoine**, LM Jacobus, C Kleim, J Goodwin, JM Bates. Human health, interagency coordination, and the need for biodiversity data. **BioScience** 70:527
- 2019 **Lemoine NP**. Moving beyond flat priors: how and why to choose informative priors in Bayesian analyses. **Oikos** 128:912-928 **Editor's Choice Forum Article**
- Lemoine NP**, MD Smith. Drought and herbivores modify nutrient cycling in the semi-arid shortgrass steppe. **Plant Ecology** 220:227-239
- Lemoine NP**. Considering the effects of temperature x nutrient interactions on the thermal response curve of carrying capacity. **Ecology** 100:e02599 **Faculty of 1000 Recommendation**
- Hoffman AM, H Perretta^{*}, **NP Lemoine**, MD Smith. Blue grama grass genotype affects palatability and preference by semi-arid steppe grasshoppers. **Acta Oecologia** 96:43-48

Komatsu KJ, ML Avolio, **NP Lemoine**, F Isbell, E Grman, GR Houseman, SE Koerner, DS Johnson, KR Wilcox, and 67 others. Global change effects on plant communities are magnified by time and the number of global change factors imposed. **Proceedings of the National Academy of Sciences USA** 116:17867-17873

2018

Lemoine NP, RJ Griffin-Nolan, AD Lock*, AK Knapp. Drought timing, not previous exposure to drought, determines sensitivity of two shortgrass species to water stress. **Oecologia** 188:965-975

Craven D, N Eisenhaur, W Pearse, Y Hautier, C Roscher, F Isbell, M Bahn, C Beierkuhnlein, G Boehnisch, N Buchmann, C Byun, J Catford, B Cerabolini, H Cornelissen, J Craine, E de Luca, A Ebeling, J Griin, A Hector, J Hines, A Jentsch, J Kattge, J Kreyling, V Lanta, **NP Lemoine**, S Meyer, V Minden, V Onipchenko, H Polley, P Reich, J van Ruijven, B Schamp, MD Smith, N Soudzilovkaia, D Tilman, A Weigelt, B Wilsey, P Manning. Multiple facets of biodiversity drive the diversity-stability relationship. **Nature Ecology and Evolution** 2:1579-1587

Knapp AK, CJ Carroll, RJ Griffin-Nolan, I Slette, F Chaves, L Baur, A Felton, J Gray, A Hoffman, **NP Lemoine**, W Mao, A Post, MD Smith. A reality check for climate change experiments: do they reflect the real world? **Ecology** 99:2145-2151

Koerner SE, MD Smith, DE Burkepile, N Hanan, ML Avolio, SL Collins, AK Knapp, **NP Lemoine**, EJ Forrester, S Eby, DI Thompson, and 71 others. Change in dominance determines herbivore effects on plant biodiversity. **Nature Ecology and Evolution** 2:1925-1932

Rehm EM, MB Balsat*, **NP Lemoine**, JA Savidge. Spatial dynamics of habitat use informs reintroduction efforts in the presence of an invasive predator. **Journal of Applied Ecology** 55:1790-1798

Stuart-Haentjens E, HJ De Boeck, **NP Lemoine**, P Mand, G Kroel-Dulay, IK Schmidt, A Jentsch, A Stampfli, WRL Anderegg, M Bahn, J Kreyling, T Wohlgemuth, F Lloret, A Classen, C Gough, MD Smith. Precipitation as a predictor of production resistance and resilience to extreme drought. **Science of the Total Environment** 636:360-366

2017

Lemoine NP. Predation risk reverses the potential effects of warming on plant-herbivore interactions by altering the relative strengths of trait- and density-mediated interactions. **The American Naturalist** 190:337-349

Lemoine NP, JD Dietrich, MD Smith. Climatic and environmental constraints on three aspects of flowering in three dominant tallgrass species. **Functional Ecology** 31:1894-1902 **Haldane Prize Nominee**

Lemoine NP, D Doublet*, JP Salminen, DE Burkepile, JD Parker. Responses of plant phenology, growth, defense, and reproduction to interactive effects of warming and insect herbivory. **Ecology** 98:1817-1828

Lemoine NP, DE Burkepile, JD Parker. Insect herbivores increase mortality and reduce tree seedling growth of some species in temperate forest canopy gaps. **PeerJ** 5:e3102

Burkepile DE, RWS Fynn, DI Thompson, **NP Lemoine**, SE Koerner, S Eby, N Hagenah, KR Wilcox, SL Collins, KP Kirkman, AK Knapp, MD Smith. Herbivore size matters for productivity-richness relationships in African savannas. **Journal of Ecology** 105:674-686

Rode M*, **NP Lemoine**, MD Smith. Prospective evidence for independent nitrogen and phosphorus limitation of grasshopper (*Chorthippus curtipennis*) growth in a tallgrass prairie. **PLoS One** 12:e0177754 **Corresponding Author**

Wilcox KR, Z Shi, LA Gherardi, **NP Lemoine**, SE Koerner, DL Hoover, E Bork, KM Byrne, J Cahill Jr, SL Collins, S Evans, AK Gilgen, P Holub, L Jiang, AK Knapp, L Yahdjian, D LeCain, P Carcia-Palacios, J Penuelas, WT Pockman, MD Smith, SR White, K Zhu, Y Luo. Asymmetric responses of primary productivity to climate extremes: a synthesis of grassland precipitation manipulation experiments. **Global Change Biology** 23:4376-4386

2016

Lemoine NP, DE Burkepile, JD Parker. Quantifying differences between native and introduced species. **Trends in Ecology and Evolution** 31:372-381

Lemoine NP, J Sheffield, JS Dukes, AK Knapp, MD Smith. The Terrestrial Precipitation Analysis (TPA) web tool: a resource for characterizing long-term precipitation regimes and extremes. **Methods in Ecology and Evolution** 7:1396-1401 **Included in BES/ESA virtual issue – Extreme events, ecosystem resilience and human well-being**

Lemoine NP, A Hoffman, A Felton, L Baur, F Chaves, J Gray, Q Yu, MD Smith. Underappreciated problems of low statistical power in ecological field studies. **Ecology** 97:2554-2561

Lemoine NP, AA Shantz. Increased temperature causes protein-limitation by reducing nitrogen digestion efficiency in the ectothermic herbivore *Spodoptera exigua* (Lepidoptera:Noctuidae). **Physiological Entomology** 41:143-151

Burkepile DE, DI Thompson, RWS Fynn, SE Koerner, S Eby, N Govender, N Hagenah, **NP Lemoine**, KJ Matchett, KR Wilcox, SL Collins, KP Kirkman, AK Knapp, MD Smith. Fire frequency drives habitat selection by a diverse herbivore guild impacting top-down control of plant communities in an African savanna. **Oikos** 125:1636-1646

Hamerlinck G, **NP Lemoine**, GR Hood, KC Abbott, AA Forbes. Meek women with powerful daughters: effects of novel host environments and small trait differences on parasitoid wasp competition. **Oikos** 125:1516-1527

Shantz AA, **NP Lemoine**, DE Burkepile. Nutrient loading alters the performance of key nutrient exchange mutualisms. **Ecology Letters** 19:20-28 **Faculty of 1000 Recommendation, George Mercer Award Nominee**

Zanveld JR, DE Burkepile, AA Shantz, CE Pritchard, R McMinds, J Payet, R Welsh, A Simoes-Correa, **NP Lemoine**, S Rosales, C Fuchs, J Maynard, R Vega-Thurber. Overfishing and nutrient pollution interact with temperature to disrupt coral reefs down to microbial scales. **Nature Communications** 7:11833

2015 **Lemoine NP**, J Shue, B Verrico*, D Erickson, WJ Kress, JD Parker. Phylogenetic relatedness and leaf functional traits, not introduced status, influence community assembly. **Ecology** 96:2605-2612

Lemoine NP. Climate change may alter monarch spring migration and summer breeding ground distributions. **PLoS One** 10:e0118614

Lemoine NP, J Capdevielle*, JD Parker. Effects of *in situ* climate warming on larval monarch (*Danaus plexippus*) development. **PeerJ** 3:e1293

2014 **Lemoine NP**, ST Giery, DE Burkepile. Differing consumer stoichiometric constraints across ecosystems. **Oecologia** 174:1367-1376

Lemoine NP, DE Burkepile, JD Parker. Variable effects of temperature on insect herbivory. **PeerJ** 2:e376 **Featured Article**

Cook-Patton SC, L Maynard*, **NP Lemoine**, J Shue, JD Parker. Cascading effects of a highly specialized beech-aphid-fungus interaction on forest regeneration. **PeerJ** 2:e442

2013 **Lemoine NP**, WA Drews*, DE Burkepile, JD Parker. Temperature alters feeding behavior of a generalist herbivore. **Oikos** 122:1669-1678

Burkepile DE, J Allgeier, A Shantz, CE Pritchard, **NP Lemoine**, L Bhatti, CA Layman. Carnivorous fishes as vectors of nutrients on coral reefs: the role of nutrient supply in facilitating seaweed abundance. **Scientific Reports** 3:1493

Giery ST, **NP Lemoine**, CM Hammerschlag-Peyer, R Abbey-Lee, CA Layman. Bidirectional trophic linkages couple a canopy and understory food web. **Functional Ecology** 27:1436-1441

Parker JD, ME Torchin, RA Hufbauer, **NP Lemoine**, C Alba, DM Blumenthal, O Bossdorf, JE Byers, AM Dunn, RW Heckman, M Hejda, V Jarosik, A Kanarek, LB Martin, SE Perkins, P Pysek, K Schierenbeck, C Schloeder, R van Klinken, KJ Vaughn, W Williams, L Wolfe. Do invasive species perform better in their new ranges? **Ecology** 94:985-994

2012 **Lemoine NP**, DE Burkepile. Temperature-induced mismatches between metabolism and consumption reduce consumer fitness. **Ecology** 93:2483-2489

Lemoine NP, JF Valentine. Structurally complex habitats provided by *Acropora palmata* alter ecosystem processes on a patch reef in the Florida Keys National Marine Sanctuary. **Coral Reefs** 31:779-786

2007 **Lemoine NP***, N Buell*, AL Hill, MS Hill. Assessing the utility of sponge microbial symbiont communities as models to study global climate change: a case study with *Halichondria bowerbanki*. In: MR Custdio, G Lbo-Hajdu, E Hajdu, G Muricy (eds). **Porifera Research: Biodiversity, Innovation, and Sustainability**, Srie Livros 28. Museu Navional, Rio de Janeiro. Pp: 419-425



TEACHING

2021 – present	CORE1929 – Data Science	Marquette University
2020 – present	BIOL3400 – Ecology	Marquette University
2019 – present	BIOL8931 – Biometry	Marquette University
2018	ECOL592 – Seminar	Colorado State University
2016 – 2017	EBIO4410/5410 – Biometry	University of Colorado
2016	ECOL592 – Seminar	Colorado State University
2011	BIOL1011L – Gen Bio Lab II	Florida International University
2011	BIOOCE3043L – Marine Bio Lab	Florida International University
2010	BIOL3043L – Ecology Lab	Florida International University



STUDENTS AND COMMITTEES

2020 – present	Ethan Rose <i>PhD Student</i>	Marquette University
2021 – present	Justine Nguyen <i>PhD Committee Member</i>	Marquette University
2018 – 2019	Morgan Crump <i>Honors Thesis Committee Member</i>	Colorado State University
2018 – 2019	Cassandra Brown <i>Honors Thesis Committee Member</i>	Colorado State University
2017 – 2018	Madison Rode <i>Honors Thesis Committee Chair</i>	Colorado State University



INVITED PRESENTATIONS

2021	Wake Forest University
2020	University of Massachusetts, Boston
2019	Brigham Young University
2019	Washington State University
2018	Marquette University
2018	University of Maryland
2018	San Diego State University
2018	Harvard University
2018	North Carolina State University
2017	Utah State University
2017	University of Texas
2017	Smithsonian Environmental Research Center
2017	Ecological Society of America
2017	University of Saskatchewan
2017	University of British Columbia
2015	Colorado State University
2013	Entomological Society of America



PROFESSIONAL ACTIVITY

2021 – present	Diversity, Equity, Inclusion Subcommittee	Milwaukee Public Museum
2020 – present	Graduate Student Recruitment Committee	Marquette University
	<i>Collaborative Activities</i>	
2019 – present	Terrestrial Parasite Tracker <i>Research advisory board member</i>	Milwaukee Public Museum

2017 – 2019	Drought-Net <i>Steering committee member</i>	Colorado State University
2016	LTER Working Group <i>Community responses to resource experiments: communities to ecosystems.</i> <i>Participant</i>	Colorado State University
2015 – 2016	Grazing Consortium <i>Participant</i>	Colorado State University
2015 – 2016	iDiv Working Group <i>Evolution of stability. Participant</i>	Colorado State University

Peer Review

Reviewer for the following journals: Acta Physiologiae Plantarum, Animal Microbiome, Annals of Applied Biology, Biological Invasions, Biology Letters, BMC Ecology, Ecography, Ecology, Ecoscience, Ecosphere, Ecology Letters, Frontiers in Ecology and Evolution, Functional Ecology, Global Change Biology, Journal of Animal Ecology, Journal of Applied Ecology, Journal of Arid Environments, Journal of Biogeography, Journal of Ecology, Journal of Plant Ecology, Journal of Thermal Biology, Methods in Ecology and Evolution, Nature Ecology and Evolution, Neobiota, New Phytologist, Oecologia, Oikos, PeerJ, Plant Ecology, PLoS One, Proceedings of the Royal Society – B, Restoration Ecology

NSF external reviewer – DEB Populations and Communities

Undergraduate Mentorship

* denotes undergraduate researcher

2021 – present	Rachel Chason	Marquette University
2021 – present	Chloe Langridge	Marquette University
2021 – present	Anesti Sotirovski	Marquette University
2020 – present	Shayla Husted	Marquette University
2021	Michelle Jiang	Wake Forest University
2020 – 2021	Joseph Sizemore	Marquette University
2020	Richard Dempsey	Marquette University
2018 – 2019	Cassandra Brown*	Colorado State University
2018 – 2019	Morgan Crump*	Colorado State University

2017 – 2018	Abigail Lathrop-Melting	Colorado State University
2017 – 2018	Sam Rollman	Colorado State University
2015 – 2018	Abigail Lock *	Colorado State University
2016 – 2018	Madison Rode *	Colorado State University
2017	Holly Perretta **	Colorado State University
2015 – 2017	Megan Coyle	Colorado State University
2016 – 2017	Tarun Multhineni	Colorado State University
2016 – 2017	Kiloaulani Kaava-Gonzalez	Colorado State University
2016	Jeremy Tabke	Colorado State University
2015	Erica Duda	Colorado State University
2015	Brianna Magbual	Colorado State University
2015	Megan Palmer	Smithsonian Institution
2014	Jillian Capdevielle *	Smithsonian Institution
2014	Dejeanne Doublet *	Smithsonian Institution
2013	Lauren Maynard *	Smithsonian Institution
2012	Willem Drews *	Smithsonian Institution
2012	Brittany Verrico *	Smithsonian Institution
2011	Joseph Barger	Florida International University
2011	Amaury Marquez	Florida International University
	<i>Media Coverage</i>	
2018	Science News	
	<i>As temperatures rise, so do insects' appetites for corn, rice, and wheat</i>	
2017	Statistical Modeling, Causal Inference, and Social Science	
	<i>Type M errors in the wild – really the wild!</i>	

- 2017 **Uncommon Ground**
Noisy data and small sample sizes are a bad combination
- 2017 **Smithsonian Shorelines**
Scientists turn up the heat on herbivores and their food
- 2016 **The EEB & Flow**
The problematic effect of small effects
- 2016 **CSU SOURCE**
Are invaders different? 'Nope' says CSU biologist
- 2015 **Smithsonian Science News**
Warming temperatures may mean more monarch generations in North America
- 2015 **PeerJ**
Interview with the author