Jeff Chieppa, PhD
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https://jjchieppa.github.io/

EDUCATION

Doctor of Philosophy, Western Sydney University (Australia) ***2020***
Hawkesbury Institute for the Environment
Ecosystem Function, Integration, and Modeling group
Dissertation: Rainfall variability, plant functional traits and productivity in grasslands

Master of Science, Auburn University ***2015***
School of Forestry and Wildlife Sciences
Forest Health Dynamics Laboratory & Southern Forest Tree Nursery Cooperative
Thesis: Interaction of future climate change scenarios of elevated tropospheric ozone and altered rainfall on loblolly pine seedlings inoculated with ophiostomatoid fungi

Bachelor of Science, SUNY College of Environmental Science and Forestry ***2012***
Department of Environmental and Forest Biology
Focus: Mycology, forest pathology, plant microbe interactions, entomology

PROFESSIONAL AND RESEARCH EXPERIENCE

Data Science Consultant, Trical ***Jul 2025-current***
- Leverage R, Python, and Git to develop novel first-principles and machine learning models for crop protection/forecasting initiatives
- Lead solo modeling efforts including direct and indirect effects of soil fumigants on microbial populations, soil functioning, crop yield, etc.
- Provide guidance on developing an emerging data science program within the Trical Group (data collection protocols, meta-data collation, database formatting)

Senior Data Scientist, Corteva Agriscience ***Jul 2022-Jan 2025***
Advanced Modeling and Artificial Intelligence Team
Crop Protection Decision Science and Climate Forecasting Team
- Leverage R, Python, and Git to develop novel first-principles and machine learning models for crop protection/forecasting initiatives
- Lead solo and collaborative modeling efforts including fungal virulence/dispersion (Hysplit, heuristic models), genetic variation in plant tolerance/phenology, in-season and long-term forecasting of plant-pathogen interactions

Postdoctoral Research Associate, Texas Tech University ***Sep 2021-Jun 2022***
Biological Sciences
Physiology for Understanding the Functioning of Ecosystems
- Soil resource (Nutrient Network) effects on leaf-level and whole plant physiological acclimation using eco-evolutionary optimality principles (global meta-analysis)

Postdoctoral Fellow, Auburn University ***Aug 2020-Aug 2021***
School of Forestry and Wildlife Sciences
Tree Physiology Laboratory

- Partitioning adaptation vs. acclimation in C4 photosynthesis and productivity using locally adapted populations of a widespread grass species grown under reciprocal transplant
- Leveraging AI algorithms for analyzing instantaneous responses of plant photosynthesis to variable CO_2 amounts (AC_i)

Postdoctoral Scientist, University of North Florida ***Aug 2019-Aug 2020***
Department of Biological Sciences
Plant physiological ecology

- Leaf economic and stomatal traits influence leaf temperature regulation and heatwave tolerance in North American oak (*Quercus*) species
- Thermal acclimation of leaf respiration is consistent in tropical and subtropical populations of two mangrove species
- Drought length and genotype modify heat effects on C_4 leaf physiology

Research Technician (half-time), Western Sydney University ***Jan 2019-Aug 2019***
Microbial Ecology Laboratory at the Hawkesbury Institute for the Environment

- Prepare and analyze DNA from soil samples and plant roots (bacteria, fungal biomass estimation)

Research Data Analyst (half-time), Western Sydney University ***Mar 2019-Jun 2019***
Plant Ecology Laboratory at the Hawkesbury Institute for the Environment

- Assessing urban tree canopy traits for understanding cooling for urban heat island mitigation in the greater Sydney region

Plant Ecology Research Technician, Syracuse University ***May 2012-Dec 2012***
Department of Biological Science, Plant Ecology Laboratory

- Leaf phenological responses to latitude variation in invasive and native congeneric shrubs
- Elevation and moisture as drivers of tree productivity in Great Smoky Mountain National Park assess through dendrochronological techniques
- Latitudinal variation in early successional community dynamics across eastern North America

Suburban Ecology Internship, Mianus River Gorge Preserve ***Jun 2011-Aug 2011***

- Urban detection and movement ecology of wildlife in urban and suburban New York City
- Early detection surveying for Hemlock Wooly Adelgid in old growth Hemlock forests

TECHNICAL SKILLS

R in RStudio (R markdown and notebooks)
Python in VSCode/Pycharm (Jupyter)
SQL queries

- Git
- Univariate, multivariate, and mixed effects modeling
- First-principles modeling (plant growth/yield/phenology, photosynthesis)
- Weather station and time-series analysis
- Machine learning (RF, XGBoost) and some AI algorithms (ANN)
- Optimization (gradient descent, simulated annealing)
- GIS and visualization (plotly, terra, geopandas, shapely, Google Earth Engine)
- Kubernetes (pod and remote computing)

PUBLICATIONS

Cheaib, A, **J Chieppa**, E Perkowski, and NG Smith. *Accepted*. Soil resource acquisition strategy modulates global plant nutrient and water economics. *New Phytologist*

Szejgis, J, Y Carrillo, TC Jeffries, FA Dijkstra, **J Chieppa**, S Horn, D Bristol, P Maisnam, D Eldrige, and UN Nielsen. 2024. Altered rainfall greatly affect enzyme activity but has limited effect on microbial biomass in Australian dryland soils. *Soil Biology and Biochemistry* 189

Smith, MD, …, **J Chieppa**, *et al*. 2024. Extreme drought impacts have been underestimated in grasslands and shrublands globally. *PNAS* 121 (4)

Maisnam, P, TC Jeffries, J Szejgis, D Bristol, BK Singh, DJ Eldrige, S Horn, **J Chieppa**, and UN Nielsen. 2023. Severe prolonged drought favours stress-tolerant microbes in Australian drylands. *Microbial Ecology* 86 (4)

Chieppa, J, IC Feller, K Harris, S Dorrance, MA Sturchio, E Gray, MG Tjoelker, and UN Nielsen. 2023. Thermal acclimation of leaf respiration is consistent in tropical and subtropical populations of two mangrove species. *Journal of Experimental Botany* 74 (10)

Aspinwall, MJ, CJ Blackman, C Maier, MG Tjoelker, PD Rymer, D Creek, **J Chieppa**, RJ Griffin-Nolan, and DT Tissue. 2023. Aridity drives clinal patterns in leaf traits and responsiveness to precipitation in a broadly distributed Australian tree species. *Plant-Environment Interactions* 4 (2)

Griffin-Nolan, RJ, **J Chieppa**, AK Knapp, UN Nielsen, and DT Tissue. 2023. Coordination of hydraulic and morphological traits across dominant grasses in eastern Australia. *Functional Ecology* 37 (4)

Sturchio, MA, **J Chieppa**, LT Simpson, IC Feller, SK Chapman, and MJ Aspinwall. 2023. Contrasting effects of nitrogen addition on leaf photosynthesis and respiration in back mangrove in north Florida. *Estuaries and Coasts* 46 (1)

Chieppa, J, SA Power, UN Nielsen, and DT Tissue. 2022. Plant functional traits affect competitive vigor of pasture grasses during drought and following recovery. *Ecosphere* 13 (7)

Aspinwall, MJ, **J Chieppa**, E Gray, M Golden-Ebanks, and L Davidson. 2022. Warning impacts on photosynthetic process in dominant plant species in a subtropical forest. *Physiologia Plantarum* 174 (2)

Sturchio, MA, **J Chieppa**, SK Chapman, G Canas, MJ Aspinwall. 2022. Temperature acclimation of leaf respiration differs between marsh and mangrove vegetation in a coastal wetland ecotone. *Global Change Biology* 28 (2)

Chieppa, J, T Brown, P Giresi, TE Junger, V Resco de Dios, DT Tissue, and MJ Aspinwall. 2021. Climate and stomatal traits drive covariation in nighttime stomatal conductance and daytime gas exchange rates in a widespread C4 grass. *New Phytologist* 229 (4)

Aspinwall, MJ, M Faciane, K Harris, M O'Toole, A Neece, V Jerome, M Colon, **J Chieppa**, IC Feller. 2021. Salinity has little effect on photosynthetic and respiratory responses to seasonal temperature changes in black mangrove (*Avicennia germinans*) seedlings. *Tree Physiology* 41 (1)

Deveautour, C, **J Chieppa**, UN Nielsen, MM Boer, C Mitchell, S Horn, SA Power, A Guillen, AE Bennet, and JR Powell. 2020. Biogeography of arbuscular mycorrhizal fungal spore traits along an aridity gradient, and responses to experimental rainfall manipulation. *Fungal Ecology* 46

J Chieppa, UN Nielsen, DT Tisue, and SA Power. 2019. Drought and phosphorus affect productivity of a mesic grassland via shifts in root traits of dominant species. *Plant and Soil* 444

J Chieppa, A Bush, and C Mitra. 2018. Using "Local Climate Zones" to detect urban heat island on two small cities in Alabama. *Earth Interactions* 22 (16)

Griffin-Nolan, RJ, …, **J Chieppa**, *et al.* 2018. Trait selection and community weighting are key to understanding ecosystem responses to changing precipitation regimes. *Functional Ecology* 32 (7)

Chieppa, J, L Eckhardt, and A Chappelka. 2017. Simulated summer rainfall variability effects on Loblolly pine (*Pinus taeda*) seedling physiology and susceptibility to root-infecting ophiostomatoid fungi. *Forests* 8 (4)

Chieppa, J, A Chappelka, L Eckhardt. 2015. Effects of tropospheric ozone on Loblolly pine seedlings inoculated with root infecting ophiostomatoid fungi. *Environmental Pollution* 207

IN REVISION AND PREPARATION

Chieppa, J. and MJ Aspinwall. *Minor revision*. Drought length and genotype modify heat effects on C4 leaf physiology. *Plant, Cell, & Environment*

Chieppa, J, S Dorrance, KJ Fuller, C Garnicia-Diaz, R Castiolo-Argaez, GP John, and MJ Aspinwall. *Major revision*. Leaf economic and stomatal traits predict heatwave tolerance across eastern North American *Quercus* species. *American Journal of Botany*.

Maisnam, P, D Bristol, J Szejgis, **J Chieppa**, S Horn, TC Jeffries, BK Singh, DJ Eldridge, and UN Nielsen. *In review*. Rainfall drives decomposition in drylands, partially mediated by shifts in oligotrophic bacteria and saprotrophic fungi. *Ecology*