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SUMMARY

A certified ecologist and research scientist specializing in project management, ecological data analysis, and environmental impact assessment. Skilled in interdisciplinary collaboration, technical writing, and delivering innovative solutions to complex environmental challenges. Committed to advancing sustainability.

EDUCATION

Ph.D., Biological Sciences, University of Illinois - Chicago | 8/2017 – 8/2022

Dissertation: Legacy and Belowground Resource Availability Effects on Plant-Soil Interactions in Tallgrass Prairies

B.A., Environmental Studies with Biology minor, Eckerd College | 8/2009 – 5/2013

Dean's Scholarship (4-year academic award)

KEY SKILLS

- **Ecological Data Analysis:** EIAs, advanced statistical analysis, coding, and ArcGIS expertise.
- **Project Management:** Conception, budgeting, construction, and environmental compliance.
- **Technical Writing:** Permitting, and regularly publishing in peer-reviewed journals.
- **Communication:** Professional presentations, collaboration, and stakeholder engagement.

EXPERIENCE

Postdoctoral Research Associate, Arizona State University, Tempe, AZ | 11/2022 – present

- **Managed** site selection, construction, and compliance for two large-scale field research experiments in vulnerable ecosystems in collaboration with federal stakeholders.
- **Implemented novel research designs**, including using solar-powered pumps to push groundwater through misting systems, the first ecological research project to do so in drylands.
- **Assessed** environmental impacts of experimental treatments on plants, soil, and air using ecological monitoring and non-destructive sampling of over 300 transects.
- **Detected and corrected errors** in data collection that had been overlooked for +12 years, improving measurement accuracy by 15%.
- **Created automated data processing algorithms** for plant production and biodiversity data.
- **Improved analyses** of ecological data and regularly presented data visualizations.
- **Produced technical documents** including applications, manuals, and five peer-reviewed publications.

Graduate Researcher, University of Illinois - Chicago, Chicago, IL | 8/2017 – 8/2022

- **Simultaneously managed** up to five research projects concurrently with minimal supervision.
- **Acquired permits and ensured environmental compliance** of field research projects.

- **Led** the implementation of large-scale field research, collecting, processing and analyzing 150 soil cores and 480 decomposition litter bags.
- **Monitored soil conditions**, repairing research equipment in the field.
- **Identified and corrected** a decade-old major error in data processing.
- **Published** a peer-reviewed article and presented regularly at professional conferences.
- **Mentored** two junior researchers, training them on data collection and sample processing.

Teaching Assistant, University of Illinois - Chicago, Chicago, IL | 8/2017 – 8/2022

- **Presented** over 200 hours of scientific material to non-specialist audiences.
- **Engaged** with diverse populations of students, ensuring a safe and supportive learning environment.

Naturalist and Cabin Leader, Arrowhead Ranch Outdoor Science School, Lake Arrowhead, CA | 2 – 7/2017

- **Prepared** outdoor lessons for young students spanning diverse socioeconomic backgrounds.
- **Responsible for safety** and well-being of students.

RESEARCH PROJECTS

Mechanistic tests of aridlands threshold theory, Las Cruces, AZ | 1/2023 – present

- **Goal:** evaluate rangeland management techniques and drought impacts on long-term forage production.
- **Action:** I led the analysis of the 27-year dataset, wrote the resulting scientific article, and managed the construction of an 8-year follow-up research project.
- **Outcome:** created a novel method for quantifying production loss due to past grazing events, and initiated the follow-up study.

Interactive effects of soil and atmospheric water in drylands, Las Cruces, AZ | 5 – 10/2024

- **Goal:** research how atmospheric drought interacts with soil drought to impact grass production and leaf-level responses by manipulating soil moisture and VPD in the field.
- **Action:** I installed a solar-powered piping system to create the VPD treatment.
- **Outcome:** the project is currently functional and producing data after being stalled for two years. I gave a professional presentation and produced a technical report.

Woody-plant encroachment in Southwestern rangelands: mechanisms of invasion and opportunities of containment, Las Cruces, AZ | 1 – 5/2024

- **Goal:** evaluate rangeland management techniques and drought impacts on long-term forage production.
- **Action:** I led the analysis of the 27-year dataset, wrote the resulting scientific article, and managed the construction of an 8-year follow-up research project.
- **Outcome:** created a novel method for quantifying production loss due to past grazing events, and initiated the follow-up study.

Runoff effects on wetland soil and white cedar germination, Chicago, IL | 10/2018 – 10/2023

- **Goal:** determine highway runoff impacts on bisected wetland soil and tree germination success.
- **Action:** sampled soil for chemistry and microbial DNA. I led the analysis of DNA samples.
- **Outcome:** salt pollution from runoff has impacted soil chemistry but not soil communities. Manipulation of the water table that occurred during highway construction has likely induced tree mortality.

Land management effects on tallgrass prairie restorations, Chicago, IL | 9/2018 – 9/2023

- **Goal:** evaluate the effectiveness of restoration techniques of the USDA Forest Service for tallgrass prairies, specifically the conversion of land to row crops before native seed planting.
- **Action:** Collected and analyzed 150 soil cores in identical locations as sampling that occurred a decade previously. Monitored decomposition using 480 mesh litter bags. Installed soil monitoring equipment.
- **Outcome:** Produced two professional presentations and publications showing that conversion to row crops has lasting impacts on soil nutrient accrual. Won an award to simulate our field study in an ESM with national researchers.

Climate adaptation and sustainability in switchgrass: exploring plant-microbe-soil interactions across continental scale environmental gradients, Chicago, IL | 9/2017 – 3/2023

- **Goal:** collaborate with twelve research institutions in a nationwide effort to characterize biofuel carbon sequestration potential.
- **Action:** modified a root-viewing box design to research nutrient effects on root morphology in laboratory settings. Cleaned, scanned and preserved whole root systems. Performed elemental analysis on roots and substrate.
- **Outcome:** we proved that differential root functioning exists in grasses similar to tree root systems, a novel contribution. We demonstrated how Switchgrass roots adapt to nutrient-poor environments.

Machine learning functional data analysis for ELM biomass partitioning, Lemont, IL | 9 – 10/2021

- **Goal:** on short notice, synthesize all publicly available data on plant biomass partitioning for a technical presentation to federal scientists.
- **Action:** produced a code to synthesize and manage data from three large datasets.
- **Outcome:** successfully provided the integrated data to stakeholders for use in the presentation.

Drivers of absorptive root variation: an analysis of root functional traits from the TRY Plant Database, Chicago, IL | 2 – 8/2018

- **Goal:** acquire and analyze data on plant root morphology and physiology to research effects of nutrients.
- **Action:** Cleaned, analyzed and visualized data from the TRY Plant database using R.
- **Outcome:** Presented our results at the Ecological Society of America annual meeting.

Litter impacts on terrestrial ecosystems of urban Taiwan, New Taipei City, Taiwan | 10/2015 – 2/2017

- **Goal:** on a minimal budget, design and implement research quantifying cigarette litter impacts on soil and vegetation chemistry.
- **Action:** created a controlled research experiment using plants in pots and an observational study of cigarette litter density in public parks.
- **Outcome:** cigarette litter raised soil pH, and litter densities past 5% of pot surface area negatively impacted vegetation production.

SKILLS

Technical Skills

- Data analysis, management, and visualization
- Scientific method
- Computational modeling
- Scientific and technical writing
- Soil sampling and analysis
- Plant identification and productivity assessments

- Ecosystem health assessments and invasive species removal
- Stream-gauging and water quality assessments
- Basic carpentry and metalworking

Soft Skills

- Communication and active listening
- Morale
- Presentations, lectures and teaching
- Workspace management

Equipment Proficiencies

- Isotope Ratio Mass Spectrometry
- Elemental Analysis
- LiCor Photosynthesis System

Software / Programming

- Advanced R
- ArcGIS
- Git
- Matlab
- WinRhizo

CERTIFICATIONS AND AWARDS

- **Certification of Associate Ecologist**, Ecological Society of America | 2023
- **Graduate Research Award**, Department of Biological Sciences, UIC Liberal Arts and Sciences | 2022
- **Graduate Teaching Award**, Department of Biological Sciences, UIC Liberal Arts and Sciences | 2021
- **“Honoring Our Professors’ Excellence” HOPE Award**, UIC Housing | 2018
- **Certificate of Completion of the National Homeless Challenge**, National Coalition for the Homeless | 2011

PROFESSIONAL SUPPORT (~\$90,000 to date)

- **ESA Soil Ecology Section Registration Award - \$60**, Soil Ecology Section, Ecological Society of America | 2021
- **DOE Office of Science Graduate Student Research (SCGSR) Program award - \$15000**, DOE Office of Science | 2021
- **ESA Soil Ecology Section Registration Award - \$60**, Soil Ecology Section, Ecological Society of America | 2020
- **Elmer Hadley Graduate Research Grant - \$3960**, Department of Biological Sciences, University of Illinois at Chicago | 2020
- **Elmer Hadley Graduate Assistantship - \$6809**, Department of Biological Sciences, University of Illinois at Chicago | 2020
- **ESA Soil Ecology Section Travel Award - \$300**, Soil Ecology Section, Ecological Society of America | 2019
- **Elmer Hadley Graduate Research Grant - \$2955**, Department of Biological Sciences, University of Illinois at Chicago | 2019
- **LAS Travel Award - \$174**, College of Liberal Arts & Sciences, University of Illinois at Chicago | 2019

- **BioSci Departmental Award - \$600**, Department of Biological Sciences, University of Illinois at Chicago | 2018
- **Dean's Scholarship Award - ~\$60000**, Eckerd College, 2009

PUBLICATIONS

Glass, N., Gonzalez-Meler, M., Drewniak, B. Overestimation of grassland decomposition and soil organic carbon accrual in E3SM: a comparison to the field. In preparation for *Advances in Modelling Earth Systems*.

Glass, N., Janssen, E., Johnson, S.A., Dickerson, P., Whelan, C.J., Green, S., Molano-Flores, B. How does salt pollution and water table alterations impact soil microbial diversity in fens? In preparation for *Applied Soil Ecology*.

Glass, N., Asbjornsen, H.; Feldman, A.; Green, J.; Kannenberg, S.; Knapp, A.; Konings, A.; Litvak, M.; Reed, S.; Sala, O.; Smith, M.; Vivoni, E. Resolving the importance of atmospheric versus soil water control of terrestrial ecosystem functioning. Submitted to *New Phytologist*.

Dias de Oliveira, E., **Glass, N.**, Yun, K., Habermann, E., Matamala, R., Zare, A., Kim, S., Gonzalez-Meler, M. Organic Phosphorus Promotes Root Architectural Plasticity: unraveling the connection between root form and function. Submitted to *Plant and Soil*.

Janssen, E., Johnson, S.A., **Glass, N.**, Dickerson, P., Whelan, C.J., Molano-Flores, B. 2024. Impacts of road salt on seed germination of *Thuja occidentalis* found in natural communities adjacent to the Illinois Tollway in northeastern IL USA. *Botany Just-IN*. doi: 10.1139/cjb-2023-0137.

Glass, N., Dias de Oliveira, E., Matamala, R., Yun, K., Kim, S., Gonzalez-Meler, M.A., 2023. Perennial grass root system specializes for multiple resource acquisitions with differential elongation and branching patterns. *Frontiers in Plant Science* 14. doi: 10.3389/fpls.2023.1146681.

Glass, N., Dias de Oliveira, E., Drewniak, B., Matamala, R., Whelan, C.J., Gonzalez-Meler, M.A., 2023. Root litter decomposition rates and impacts of drought are regulated by ecosystem legacy. *Applied Soil Ecology* 189, 104903.

Johnson, S.A., Janssen, E., **Glass, N.**, Dickerson, P., Whelan, C.J., Molano-Flores, B., 2022, The role of environmental stressors on reproduction, seed morphology, and germination: A case-study of Northern White Cedar, *Thuja occidentalis* L. *Botany* 100(11): 839-847. doi: 10.1139/cjb-2022-0007.

Glass, N., Molano-Flores, B., Dias de Oliveira, E., Meraz, E., Umar, S., Whelan, C.J., Gonzalez-Meler, M.A., 2021. Does pastoral land-use legacy influence topsoil carbon and nitrogen accrual rates in tallgrass prairie restorations? *Land* 10, 735. doi: 10.3390/land10070735.

PRESENTATIONS

Glass, N., Sala, O. Atmospheric versus soil moisture: partitioning drivers of plant productivity in drylands. Oral presentation at 2024 ESA Annual Meeting, Long Beach, CA.

Glass, N., Sala, O. Effects of precipitation and defoliation on Black grama cover in the Jornada Basin. Oral presentation at 2023 ESA Annual Meeting, Portland, OR.

Glass, N., Dias de Oliveira, E., Drewniak, B., Matamala, R., Whelan, C.J., Gonzalez-Meler, M.A. 2021. Root litter decomposition rates and impacts of drought are regulated by ecosystem legacy. Oral presentation at 2021 ESA Annual Meeting (virtual).

Glass, N., Dias de Oliveira, E., Kyungdahm, Y., Kim, S.H., Matamala, R., Gonzalez-Meler, M.A. 2020. Root response to resource partitioning in a perennial grass. Oral presentation at 2020 ESA Annual Meeting (virtual).

Glass, N., Molano-Flores, B., Dias de Oliveira, E., Whelan, C.J., Gonzalez-Meler, M.A. 2019. Soil carbon stock dynamics in six land use types at a national tallgrass prairie. Oral presentation at 2019 ESA Annual Meeting, Louisville, KY.

Glass, N., Dias de Oliveira, E., Gonzalez-Meler, M.A. 2018. Drivers of absorptive root variation: An analysis of root functional traits from the TRY Plant Database. Poster presented at 2018 ESA Annual Meeting, New Orleans, LA.

References available upon request