

Josh Leon

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Education

Bachelor's of Science in Bioinformatics

Current GPA: 3.89

Utah Valley University

2019 -> 2023

Certificate of Proficiency in Geographic Information Systems (GIS)

Current GPA: 4.0

Utah Valley University

2021 -> 2023

Publications

Wainwright, B. J., **Leon, J.**, Hickman, K. J., Vilela, E., Caldwell, J., Aimone, B., Bischoff, P., Ohran, M., Morelli, M. W., Arlyza, I. S., Marwayana, O. N., & Zahn, G. (2023). Wallace's line is a barrier to the dispersal of marine bacteria. *In Review*.

Skills

Lab

Media preparation, Fungal cell culture, DNA extraction, Inoculum formulation

Field

Plant identification, Sample collection, Water quality measurements

Programming Languages

Bash, Python, R, SQL

Microsoft Office

Excel, Outlook, OneNote, PowerPoint, Word

Additional

Greenhouse maintenance, growth chamber experience, GIS

Research

NSF Research Experience for Undergraduates (REU)

PI: Dr. Posy Busby

In the Busby lab at Oregon State University, I had the opportunity to work closely with a postdoctoral researcher and another undergraduate student on a research project funded by the NSF CAREER grant program. We worked with poplar trees, *Populus trichocarpa*, to test the hypothesis that proximate fungal species pools and plant genotype jointly determine fungal leaf endophyte community structure. From this REU, I greatly improved my lab skills by learning how to prepare media, culture fungi, and create inoculum for inoculation trials. Additionally, I gained a deeper understanding of the scientific method and research process.

Determining abiotic influences on plant-associated bacterial communities

PI: Dr. Michael C. Rotter

Understanding the response patterns exhibited by plant communities and their associated microbes under climate change is imperative in formulating strategies to effectively bolster the resilience of the ecosystem. As the lead researcher, I investigated how the bacterial community structure of an invasive plant responded to simulated climate change. RStudio has been used to analyze and characterize the plant-associated bacterial community.

Comparing metagenomic methods for model and non-model Systems

PI: Dr. Geoff Zahn

The goal of this research was to test the efficacy of commonly used tools in metagenomic pipelines between a model system (the human gut) and a non-model system (mangroves). A cluster on the University of Utah's high-performance computing network was utilized. Preliminary findings show that output from the data in the non-model system lacks the required information needed for gene & protein characterization in the databases when compared to the model system.

Creating a nutrient mass-balance model for a hyper-eutrophic lake

PI: Dr. Weihong Wang

For residents living in the Utah Valley area, Utah Lake holds great cultural, recreational, and intrinsic value. However, the lake's murky appearance and harmful algal blooms (HABs) have negatively affected the lake's image. The goal of this research is to provide policymakers, the local industry, researchers, and citizens with up-to-date data on nutrient levels in the lake as well as to create a model to estimate nutrient loading from different sources. In-situ collection of water samples in and around the lake and GIS/remote sensing techniques are being used to create the model.

A Toxic Legacy: Nuclear Pollution in the Navajo Nation

Student-led project

Pollution from nuclear waste deposited in the Navajo Nation has led to a variety of negative effects for those living on the reservation. We identified key stakeholders of this issue, interviewed those with living experience, conducted an in-depth literature review, created a systems map to show stakeholder interactions, and proposed levers of change to help resolve this issue.

Employment

Botany Lab Manager Assistant

Aug 2022 -> Current

Prepared materials and tested lab methods for botany professors to use in their course work. Organized and cleaned lab spaces and glassware.

Instructional Assistant - Biology/Botany

Jan 2022 -> May 2022

Graded student's work and provided constructive feedback to students in introductory biology and a plant kingdom course at Utah Valley University.

Biology & Chemistry Tutor

Aug 2021 -> Dec 2021

Provided students with resources, study tips, and individual help on their biology and chemistry course work.

NSF Utah Lake Internship

May 2021 -> July 2021

Worked on an interdisciplinary project focused on restoring the health and image of Utah Lake. Utah Lake suffers from a bad image due to its murky appearance and the harmful algal blooms it experiences. Collected water samples and performed data analysis on spatial information for the Lake. Also, presented our findings to local stakeholders

Instructional Assistant - Chemistry

Sept 2020 -> May 2021

Graded student's work and provided constructive feedback to students in an introductory chemistry course at Utah Valley University.

Code contributions

Geoffrey Zahn, Magnolia Morelli, KJE Hickman, **Josh Leon**, Ernie Vilela, Behlee Aimone, Jensen Caldwell, & Porter Bischoff. (2023). *Gzahn/syringodium_bacteria: Bacterial traits added*. Zenodo. <https://doi.org/10.5281/ZENODO.7729693>

Honors, Awards, and Grants

Undergraduate Research Scholarly and Creative Activities (URSCA) grant

Award: \$2,000
2022

A research grant to cover hourly pay for work on algal bloom research.

URSCA dissemination grant

Award: \$1,500
2021

A travel grant to cover for the GSA annual conference.

URSCA grant

Award: \$2,000
2021

A research grant to cover hourly pay for work conducted in Capitol Reef National Park

Capitol Reef Field Station (CRFS) grant

Award: \$3,000
2021

A research grant to cover research supplies and equipment,

NSF Scholarship in Science, Technology, Engineering and Math (SSTEM)

A full tuition scholarship which also provides funds for research supplies and travel costs to disseminate research

Award: \$23,580

2020

Dean's list

Awarded for maintaining a GPA ≥ 3.60

Utah Valley University

2019

Presentations

National Science Foundation 2023 SSTEM Conference

Determining abiotic influences on plant-associated bacterial communities

Washington D.C.

Mycological Society of America 2023 Conference

Comparing Metagenomic Methods Between Model versus Non-model Systems

Flagstaff, Arizona

Botanical Society of America 2023 Conference

Invasive Plants in a changing climate. Do microbes aid success?

Boise, Idaho

Utah Valley User Group 2023 Q2 Meeting

Utah Lake: Nutrient Loading and Algal Blooms

Springville, Utah

UVU 2023 Geospatial Applications Symposium

Creating a nutrient mass-balance model for a hyper-eutrophic lake

Orem, Utah

Association of American Geographers 2023 Conference

Creating a nutrient mass-balance model for a hyper-eutrophic lake

Denver, Colorado

Utah Conference on Undergraduate Research 2023

Invasive Plants in a changing climate. Do microbes aid success?

Salt Lake City, Utah

Global Map the System 2022 Competition

A Toxic Legacy: Nuclear Waste in the Navajo Nation

Oxford, England

Utah Conference on Undergraduate Research 2022

Microbes, Climate, and Invasive Plants: Do Specific Microbes Support Plant Invasions Under Modeled Climate Change Conditions?

St. George, Utah

UVU Map the System 2021 Competition

The Social Impact of Radioactive Waste in the Navajo Nation.

Orem, Utah

Geological Society of America 2021 Conference

Investigating phosphorus and nitrogen input to Utah Lake from its tributaries and the surrounding wastewater treatment plants.

Portland, Oregon

NSF Utah Lake 2021 Internship

Investigating phosphorus and nitrogen input to Utah Lake from its tributaries and the surrounding wastewater treatment plants.

Orem, Utah