## CONTACT

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## EDUCATION

PhD Environmental Science,
Minor in Natural Resource Management
The University of Arizona,
2021

B.S. in Biological Sciences, minor in Chemistry
Northern Arizona University
2012

## SKILLS

- Environmental Science
- Earth System Science
- Carbon Dioxide Removal
- Genomics
- Cloud Computing
- Strategic Data Science

## HONORS & AWARDS

NSF Earth Science Postdoctoral Research Fellow

Department of Energy Joint Genome Institute CSP New Investigator Award

NSF LTER Synthesis Network

NASA Space Grant Fellow

NSF Students Across Virtual Institutes Fellow

NSF Graduate Research Fellowship Program

Carson Science Communication Scholar

Sloan Indigenous Graduate Partnership Fellow

## PUBLICATIONS

https://scholar.google.com/citations?hl=en&user=TjtNlmcAAAAJ

# Dawson Fairbanks, PhD

## BIOINFORMATICIAN AT FUNGA PBC

Tucson, Arizona, United States


**Summary**

Experienced Environmental Research and Data Scientist bringing a decade of experience in Earth System Science and Soil Biogeochemistry. I integrate diverse datasets across scales to derive novel insights. Collaborative, creative, and independent, I am passionate about providing applied research solutions to environmental challenges.


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## EXPERIENCE

### FUNGA PBC
**Bioinformatician**
January 2024 - Present

First Data Science hire at Funga, helping scale infrastructure and leading computational biology. Developed cloud-native pipelines, machine learning models integrating biodiversity and forest productivity outcomes. Cultivate strategic partnerships and integrate work with carbon dioxide removal community at American Geophysical Union.

- Built scalable end-to-end genomics workflow processing 10k+ eDNA samples for biodiversity analysis.
- Led flagship biodiversity paper and presented results at academic meetings and led cross-cutting Carbon Dioxide Removal Sessions at AGU.

### NSF EARTH SCIENCE POSTDOCTORAL RESEARCH FELLOW
**Lead Investigator**
August 2023 – May 2024

Lead investigator for cross network integrated research project analyzing the distribution of microbial traits across scales harmonizing data across network observatories. Led the EMERGENT metagenomic research group harmonizing metagenome-assembled genomes from the Joint Genome Institute into metabolic modeling framework. Led innovative research describing functional and taxonomic distributions of unknown phyla and taxa.

**INDEPENDENT CONTRACTOR**
**Computational Biology, Cloud Computing**
March 2023- August 2023

Developed scalable bioinformatic pipelines for amplicon and metagenomic data for academic partners. Automated tasks, created and published reproducible workflows, set up clouding computing environments with tools for bioinformatic analyses, trained students and led computational workshops in FAIR data science principals.

**THE UNIVERSITY OF ARIZONA**
**Postdoctoral Research Fellow**
January 2022- March 2023

Lead Principal Investigator on a Department of Energy CSP research grant investigating seasonal, trait-based microbial responses to moisture pulse events in the Jemez River Basin Critical Zone. Led a metagenomic analysis assembling metagenome-assembled genomes (MAGs) and identified temporal and biogeographic microbial patterns linked to seasonality and snowmelt, integrating high-resolution environmental sensor and watershed stream data. Collaborated with the Joint Genome Institute to apply machine learning, genomics, and advanced statistical methods at the watershed scale, and developed scalable data science workflows with automated Shell pipelines on high-performance cloud computing environments.

**THE UNIVERSITY OF ARIZONA**
**NSF Graduate Research Fellow**
September 2014- December 2021

Lead microbial ecologist in the Jemez River Basin Critical Zone Observatory investigating microbial responses to changing precipitation, snowmelt, and fire disturbance impacts in mixed-conifer forests. Led field campaigns and oversaw other in laboratory techniques and analytical approaches for biological and geochemical samples. Use combined approaches in genomics, high resolution organic matter, hydrology, geochemistry, and remote sensing to investigate weathering, carbon cycling and water quality dynamics at the watershed scale.

**NORTHERN ARIZONA UNIVERSITY**
**Research Assistant**
February 2012 – March 2013

Co-developed novel stable isotope probing technique for modeling soil carbon cycling and Carbon Use Efficiency with Paul Dijkstra and Bruce Hungate's lab group. Collected samples, designed experiments, managed data, contributed to writing,

data analysis, interpretation, and presented at international conferences

**COCONINO RURAL ENVIRONMENT CORPS**
**Americorps Service Member**
January 2013- December 2013

Conducted conservation efforts targeted toward wildlife and riparian habitat restoration, forest fire fuels reduction, erosion control, and trail maintenance in remote regions in Arizona and southern Utah.

**USDA FOREST SERVICE**
**Biological Science Technician**
May 2012- August 2012

Monitored and collected wildlife field data while living and working in a remote research station in Alaska at Anana Bear Observatory. Managed visitor interactions with wildlife, taught conservation topics and provided information on coastal ecosystem ecology.

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**LEADERSHIP EXPERIENCE & SYNERGISTIC ACTIVITIES**

**American Geophysical Fall Meeting**
**Session Convener and Chair**
December 2016 – December 2025

Organized scientific sessions related to scaling microbial dynamics to biogeochemical cycles and carbon dioxide removal at scale at the AGU Fall Meeting (totaling 13 oral sessions, 8 poster sessions and over 450 abstract submissions). Invited prominent researchers to present, advertised sessions, managed abstract submissions, recruited judges, and convened sessions

**NATIONAL CENTER FOR ECOLOGICAL ANALYSIS AND SYNTHESIS**
**Lead Investigator**
September 2022 – Present

Collaborated with international group of scientists from top research institutions to establish shared bioinformatic workflows, contributed data for synthesis, and built tools and reference databases to advance microbial ecological research (>10 TB Data).

**NATIONAL ECOLOGICAL OBSERVATORY NETWORK**
**Microbial Technical Working Group Member**
August 2019 – Present

Collaborated with NEON data science team to provide technical support and establish best practices and workflows for 30-year effort collecting continental scale microbial datasets. Co-

developed *neonMicrobe* R package to analyze microbial data developed by NEON for use in synthesis and large-scale ecological analysis.

**CYVERSE FOUNDATIONAL OPEN SCIENCE SOFTWARE COURSE**
**Workshop Leader**
January 2020

Trained research scientists in best practices to develop foundational skills in open science techniques, including: tools for managing the data lifecycle, introduction to container technology, code development best practices, project management, HPC, distributed computing and cloud computing systems (AWC, GCS).

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**SKILLS**

**Strategic**: Data-driven development, Research Management, Leadership, Product Development (AI Integration), Workforce Development
**Geospatial Tools:** Earth Engine, ArcGIS, raster/vector processing in R (terra, sf, raster) and Python (geopandas, polars, rasterio).
**Machine Learning:** Random Forest, XGBoost, LASSO, GDM, SHAP, caret, scikit-learn
**CI/CD:** Docker, GitHub Actions, cloud-native reproducibility via AWS/GCS
**Technical:** Python, R SQL, Cloud Enginering (AWS, GCP, Azure), Data Pipelining (NextFlow, LatchBio), Object Storage (S3, GCS), Serverless Architecture (Lambda, Databricks), CI/CD, MLOps, MLFlow, AutoML (Databricks), Multivariate Statistics, Experimental Design
**Scientific:** Construction, maintenance and optimization (cost/performance) of terabyte scale cloud native data pipelines. Data Science: Global-scale analyses of earth system data, Applications of Machine Learning to Earth Systems and Soil Challenges, Chemical Analysis, Execution and Analysis of Large Scale Field Trials, PCR, qPCR, Metagenomics, DNA and RNA extraction, Ecological Survey Techniques