**HEATHER FAIR**

[**hfair@umn.edu**](mailto:hfair@umn.edu)**; https://heatherfair.com**

**Education**

The Ohio State University (Ohio, USA) Environmental Science Ph.D.

The Ohio State University (Ohio, USA) Environmental Science M.S.

University of Miami (FL, USA) International Business Mgt. M.B.A.

The Ohio State University (Ohio, USA) Marketing B.S.B.A.

**Scientific Research and Higher Education Appointments**

**National Science Foundation (NSF) Postdoctoral Research Fellow in Biology, University of Minnesota,**

**Chinese Academy of Sciences, and USDA Agricultural Research Services, Columbus, OH**

* Examining the role of sulfur-reducing bacteria and methanogens of proglacial thixotropic mud Alaska.
* Led proof-of-concept session at Ecological Society of America evaluating AI-based interpretation of scientific talks in Spanish, Portuguese, Mandarin, and Cantonese.
* Conduct field-based studies of supraglacial moss balls and associated epiphytic microbiomes and invertebrates across glacial moraines.
* Comparing cryoconite hole microbial communities between subarctic and rainforests of Alaska.
* Conducted alpine field research on Trentepohlia, moss, and lichen blooms in the temperate monsoonal and plateau climates of Mt. Gongga, Tibet.
* Designed and led a survey on challenges and accessibility in mentoring programs for Deaf and hard-of-hearing ecologists across professional organizations.
* Mentored undergraduate students in independent aquatic ecology projects as part of an NSF REU wetland mesocosm study.

**Instructor, Ohio Wesleyan University, Biology Department, Delaware, OH**

* Taught evolution, ecology, and physiology of plants, animals, protists, and fungi. Guided students in hypothesis generation, experimental design, data collection, and data analysis.
* Developed online content during COVID-19 pandemic, mentored student presentations on international responses to COVID-19 in a course open to the public which was well-received by the audience.

**Visiting Assistant Professor, Kenyon College, Biology Department, `Gambier, OH**

* Taught experimental biology integrating biodiversity, RStudio statistical analysis, DNA extraction, PCR, bioinformatics, and plant root gene expression techniques.

**Visiting Professor, Middlebury College School of the Environment, Yunnan, China**

* Course 1 - Developed and taught aquatic ecology course; mentored student field projects emphasizing scientific methodology, data analysis, and technical writing.
* Course 2 - Co-developed and co-taught environmental studies course covering water resources, life cycle analysis (LCA), and water policy. Guided students in creating and presenting projects using LCA, time-lapse photography, and cross-cultural interviews on water use with local Chinese and expatriates.

**Public Policy Appointment**

**Sea Grant Knauss Fellow, US Geological Survey, Water Mission Area, Reston, VA**

* Lea/d author of the chapter in USGS circular Value of USGS Science:Information Products.
* Analyzed USGS research outputs and presented findings at regional Sea Grant and Water Resources Research Institute (WRRI) leadership meetings.
* Served as peer reviewer on the National Water Resources Research Institute funding panel.
* Contributed to the design of USGS employee survey to inform organizational planning and development.

**Graduate Teaching Assistant & Lecturer, The Ohio State University – Master’s and Ph.D. Programs**

* Taught and assisted in courses including Human Physiology, Introductory Biology (2 semesters), Neurobiology of Animal Behavior (2 semesters), and Field Zoology at Stone Laboratory, Lake Erie.

**Instructor & Program Contributor, Chinese Flagship Program, The Ohio State University**

* Co-taught bilingual course on interpersonal relationships for U.S. Flagship Program students.
* Recruited corporate sponsors and organized Global Language Summit with international companies.

**Corporate Experience**

**WalMart Stores, Inc. – Headquarters, Bentonville, AR**

**Business Strategy Analyst, Global Procurement Division, Finance & Strategy Team**

* Developed partnerships with NGOs to identify environmental initiatives that aligned with shareholder value and Walmart’s EDLP (Everyday Low Price) strategy.
* Founding member of internal Corporate Waste and China environmental networks.
* Initiated “Green Bag Luncheon” educational series on sustainability issues.
* Designed a triple bottom line balanced scorecard and marketing strategy for a $12B division, accelerating project completion by 40% and laying groundwork for corporate-wide supply chain innovation.

**Global Systems Training Manager, Global Procurement and Information Systems**

* Reengineered purchase order (PO) process using Six Sigma methodologies, forming cross-divisional teams that reduced PO generation time by 75%.
* Led system redesign of supplier agreements for Sarbanes-Oxley compliance, reducing manual workload by 50% and coordinating rollout across 25 global offices and 2,000 suppliers.
* Selected by Executive VP to develop a digital sourcing catalog system in eBay-style to enhance ROI.
* Recruited to manage global training for sourcing systems in Americas, Asia, Europe, and Middle East.
* Provided strategic leadership to unify supplier specification, quotation, and purchase order processes. Presented key sourcing system strategies at global summits with over 800 suppliers in attendence.

**Retail Link Training Manager (Expatriate Assignment), Tsim Sha Tsui, Hong Kong**

* Expanded supplier development program from 3-month to year-long curriculum during sourcing division’s international acquisition phase.
* Conducted market data analysis from Retail Link systems accessed by 25,000+ suppliers.

**Retail Link Trainer, Information Systems Division**

* Delivered advanced analytics training (e.g., sales analysis, market basket, replenishment, forecasting) to over 4,500 suppliers across the U.S., Asia, Indian Subcontinent, and Middle East.
* Managed Retail Link systems rollout for Korea and China, increasing supplier participation in supply chain analysis from 0% to 75% in one year.

**Grant writing**

* Invited participant, Polar Early Career World Summit (PECWS), Boulder, CO – Fully funded.
* Full travel and tuition support, Fundamentals of Qualitative and Quantitative Arctic Research Using R, National Center for Ecological Analysis and Synthesis, Arctic Data Center.
* Travel and registration award, National Postdoctoral Association Annual Conference and Workshop.

**Fellowships & Grants Awarded *(Graduate: $242,000 | Postdoctoral: $328,000)***

* **NSF Postdoctoral Research Fellowship in Biology** – Glacier microbial ecology
* **Sea Grant Knauss Fellowship**, U.S. Geological Survey – Science policy, Reston, VA
* **Fulbright-Hays Doctoral Dissertation Research Abroad Grant** – Glacier stream ecology, Tibetan Autonomous Region, China
* **Robert H. Edgerley Toxicology Fellowship** – Effects of salinity on glacial meltwater invertebrates
* **U.S. Department of Education Foreign Language & Area Studies Fellowship (FLAS)** –Chinese
* **Helen M. & Milton O. Lee Aquatic Sciences Fellowship** – Aquatic ecology field research
* **Fulbright Research Fellowship** – International aquatic ecology research, Tibet
* **NSF GK-12 Teaching & Research Fellowship** – Watershed ecology education at Hiland High School.
* **NSF Yunnan IGERT Fellowship** – Interdisciplinary research training, University of Wisconsin
* **NSF East Asia and Pacific Summer Institute Fellowship** – Research collaborations in China and Taiwan

**Research Funding as Student Principal Investigator / Grant Writer** — *Total: $137,200*

* **Ohio Agricultural Research Development Center (OARDC) SEEDS Grant** – $100,000
* **Columbus Zoo Biodiversity Conservation Grant** (3 awards) – $19,000 total
* **Ohio State Office of International Affairs Travel Grant** – $8,000
* **NSF Yunnan IGERT Program**, University of Wisconsin (2 awards) – $9,000 total
* **Sophie Danforth Conservation Biology Fund Award** – $1,200

**Field Research Experience & Technical Skills**

* Designed and led glacial meltwater field campaigns in southeastern Tibet and Alaska, including sample collection in extreme, high-altitude environments.
* Invited by Chinese Academy of Sciences to co-lead a 2025 research expedition in Washington State.
* Among the first scientific teams to conduct fieldwork post-Moxi earthquake (Mt. Gongga, Tibetan Autonomous Region, October 2023).
* Conducted ecological assessments in challenging glacial, alpine, and meltwater stream environments using advanced microbiological, ecological, and habitat sampling techniques.

**Scientific Publications**

**Fair, H.**, T. Hamilton, R. Smiley, Q. Liu. (2024).Determinants of microbial community structure in supraglacial pool sediments of monsoonal Tibetan Plateau. *Microbiology Spectrum*. doi:10.1128/spectrum.00754-24.

**Fair, H.**, O. A. Medina-Báez, B. Spiecker, Q. Gan, Y. Y. Cheung, E. D’Bastiani, G.R. Goldsmith. (2024) Can AI interpretation increase inclusivity? Frontiers in Ecology and the Environment. doi:10.1002/fee.2821.

Goliber, S., J. Coenen, **H. Fair**, A.R. Szesciorka et al. (2024). Postdoc Perspectives on Leadership and Matters of Equity and Inclusion in Polar Science. *Perspectives of Earth and Space Scientists 5, 1-9.* doi:10.1029/2024CN000252.

**Fair**, H., T. Hamilton, R. Klips, P.C. Smiley Jr. (*In Prep to Submit*). The influence of glacier moss ball size and development on epiphytic microbiomes and invertebrates of moss balls of the Matanuska Glacier, Alaska. *Ecology.*

**Fair**, H., T. Hamilton, E. Hood, J. Fellman. (*In Prep*). How climate differences shape autotrophic and heterotrophic microbial communities in cryoconite holes of the Matanuska and Mendenhall Glaciers, Alaska.

Hu, Y., A. Franzetti, Q. Liu, F. Pittino, **H. Fair**, Z. Wang, Y. Luo, B. Duan, X. Lu. *In Prep*.  Dramatic shift in microbial taxonomic diversity and nitrogen metabolism potential with glacier retreat and plant colonization of the debris-covered Hailuogou glacier.

**Fair, H.**, P.C. Smiley, and R. Lanno. (*In Revision*). Hydraulic characteristics determine the distribution of organic matter, substrate, and invertebrates in a glacial-melt stream. *Hydrobiologia*.

Yang, H., **H. Fair**, Q. Liu, Z.W. Wang, B.L. Duan, X.Y. Lu. (2023) Diversity and co-occurrence networks of bacterial and fungal communities on two typical debris-covered glaciers, southeastern Tibetan Plateau. *Microbiological Research* 273, 1-12. doi: 10.1016/j.micres.2023.127409.

Lu, X.X., T. Zhang, B.L. Hsia, D.F. Li, **H. Fair**, S. Chua, L. Li, S.J. Li***.*** Proglacial river sediment fluxes in the south-eastern Tibetan Plateau: Ming Yong Glacier in the Upper Mekong River. *Hydrological Processes.* March 28, 2022*.* DOI: 10.22541/au.164847433.35996858/v1

**Fair, H.,** P.C. Smiley Jr., R. Lanno. (2022) Tolerance of glacial-melt stoneflies (Plecoptera) and morphological

responses of chloride cells to stream salinity. *Chemosphere* 293. 1-10. 10.1016/j.chemosphere.2022.133655.

**Fair, H.**, P.C. Smiley Jr., R. Lanno. (2021). Determinants of invertebrate community structure in glacial-melt streams of southeast Tibet. *Freshwater Biology* 66, 1282–1295. DOI: 10.1111/fwb.13716

**Fair, H.**, P.C. Smiley Jr., and L. Qiao. (2020) Physical, chemical, and biological characteristics of supraglacial pools on a debris-covered glacier in Mt. Gongga, Tibetan Plateau. *Arctic, Antarctic, and Alpine Research* 52, 635-649. 10.1128/spectrum.00754-24.

**Fair, H.**, L. Bair, and E.A. Greene. 2018. The Value of Water Quality Information for Targeting Agricultural Best Management Practices. United States Geological Survey (USGS) Circular.

**Fair, H**. 2017. Environmental and physiological factors influencing the distribution of aquatic insects in glacier melt streams. Ph.D. Dissertation. The Ohio State University.

**Fair, H.** 2010. Headwater landscape variations and biodiversity: applicability of Ohio habitat evaluation indices in a glacier catchment of the Mekong River. Master’s Thesis, The Ohio State University.

**Invited Presentations (\*)**

Fair, H.L.\* April 2019. Introduction to Stream Ecology, Purdue University, Ft. Wayne, Indiana.

Fair, H.L.\* June 2018. A departure from the Milner and Petts model and cryoconite hole study in Hailuogou. CAS Institute of Mountain Hazards and Environment, Chengdu, China.

Fair, H.\* 2016. Fulbright life and research in a Tibetan Village. Fulbright Reception with President Michael Drake, Ohio State University.

Fair, H.\*. 2015. Glacier stream conceptual model and physiological mechanisms of aquatic insects in southeast Tibet. Hong Kong University, Hong Kong, SAR.

Fair, H.\* 2012. Distribution of aquatic invertebrate nymphs in glacier watersheds of southeast Tibet. Univ. of Wisconsin NSF Yunnan IGERT meeting, Madison, Wisconsin.

Fair, H.\* 2009. Headwater Ecology in Taiwan. Academia Sinica, Taipei, Taiwan.

**Presentations and Special Sessions**

Fair, H. (organizer), B. Spiecker (co-organizer), O. Medina-Baez, H..G. Ortiz. Towards Equity in the Communication of Science: Harnessing the Power of AI for an Inclusive Tomorrow, Ecological Society of America 2024, Long Beach, CA.

Fair, H., T. Hamilton, P.C. Smiley Jr., and C. Hansen. How stability and maturity of Alaskan glacier moss balls influence their microbial and invertebrate communities. Ecological Society of America 2024.

Fair, H. and P.C. Smiley Jr. August 2022. Takeaways from assessing abilities and experiences of Ecology and Environmental Science Mentoring Programs in mentoring Deaf and hard of hearing students. Ecological Society of America.

Schultz, M., H. Fair, and W. Mitsch. (*mentored student*) April 2022. *An Initial Investigation of the role of wetland age, hydrology, and physiochemical factors on nitrogen-fixing microbial communities in experimental wetlaculture mesocosms at Buckeye Lake, Ohio*. The Ohio Academy of Science.

Fair, H., T. Hamilton, P.C. Smiley Jr., and Q. Liu. December 2021. Environmental Predictors of Invertebrate and Microbial Communities within Supraglacial Pools on a Debris Covered Glacier in Tibet. American Geophysical Union.

Fair, H. October 2021. Assessing the Experiences, Abilities, and Challenges that Mentoring Programs in Ecology and Environmental Sciences have in Serving Deaf and Hard of Hearing Individuals. Society for the Advancement of Chicanos/Hispanics and Native Americans in Science.

Surikova, P and H. Fair. (*mentored student*) August 2021. Influence of Wetlaculture Mesocosm age and hydrology on Macrophyte, chironomid, and mosquito populations. National Science Foundation Research Experience for Undergraduates.

Sloane, C., A. Bonn, T. Gray, H. Fair. (*mentored students*) 2017. Primary Producers as an Indicator of Biodiversity in Glacial Streams. Denman Undergraduate Research Forum.

Fair, H., R. Lanno, D. Dean. 2016. Osmotic regulation as a potential factor in distribution of aquatic nymphs in glacier watersheds. Society for Freshwater Science, Sacramento, CA.

Gibson, J., H. Fair, R. Lanno. (*mentored student*) 2014. The long-term impacts of disturbance on insect biodiversity in a Chinese mountain stream. OSU Denman Undergraduate Research Forum.

Fair, H.L. R. Lanno, T.D. Yao, L. Zhang. 2012. Conservation in southeastern Tibet Hengduan Mountain range. 4th International Ecological Sustainability Summit, Columbus, Ohio.

**Mentoring**

* Mentored student researcher to examine moss ball invertebrates and meiofauna.
* Mentored Ph.D. student at Ecological Society of America meeting. Provided career advice, guided student in applying for Presidential Management fellow to which she was awarded.
* Mentored Ohio Wesleyan University undergraduate in writing successful grant proposal
* Mentored DHH student in presenting NSF REU research results at the Ohio Academy of Science
* Mentored NSF REU students - one DHH biology major and one speech and hearing major with research projects examining effect of wetland mesocosm hydrology on cyanobacteria and aquatic insects.
* Mentored two undergraduate Kenyon College students in Fulbright applications to Laos & Taiwan and served on Fulbright review panel committee.
* Mentored twelve undergraduate volunteers in the laboratory with four conducting independent research under my guidance with presentations at undergraduate research forums.

**Professional Service and Peer Review**

* Appointed to the Ecological Society of America (ESA) *Excellence in Ecology (EEE) Scholarship* Selection Committee, recognizing outstanding contributers to ecological science.
* Provided expert peer review for 23 scientific manuscripts across interdisciplinary journals, including:
  + *EGUSphere (2), Ecological Indicators* (8), *Animals* (2), *Limnology* (2), *International Journal of Environmental Research and Public Health* (2),*Microbiology Spectrum*, *BMC Microbiology*, *Frontiers, Science of the Total Environment, Land Processes,* and *Journal of Environmental Protection*.

**Technical Skills**

* Statistical & Data Analysis: Proficient in RStudio (including *DADA2* and *Phyloseq* packages), SPSS, PC-ORD, SigmaPlot, and Minitab for advanced statistical modeling and visualization.
* Computational & Software Tools: Experience with Microsoft Project, high-performance computing (supercomputing), bioinformatics pipelines, Fiji (ImageJ), Adobe InDesign, ERDAS (remote sensing), and Visio for scientific workflows and communication.
* Field & Laboratory Techniques: Skilled in eDNA sampling, qPCR, scanning and transmission electron microscopy (SEM/TEM), and chironomid mounting and taxonomic identification.
* Languages: Mandarin Chinese (Advanced – ACTFL Oral Proficiency Interview), Spanish (Beginner), American Sign Language (ASL – Beginner), Chinese Sign Language (Beginner).

**Professional Societies**

* Fulbright Alumni Association
* Committee member, Ecological Society of America
* Society for Advancement of Chicanos/Hispanics & Native Americans in Science
* American Geophysical Union

**Service to Professional Societies, Academic Institutions, and the Community**

**Professional and Scientific Societies**

* Planning Committee Member & Participant, NSF Polar Science Early Career Community Office Postdoctoral Leadership Workshop, Boulder, CO
* Committee Member & Volunteer, Ecological Society of America (ESA); Undergraduate Poster Judge
* Abstract and Research Poster Judge, Society for Advancement of Chicanos/Hispanics & Native Americans in Science (SACNAS)
* Poster Judge, National Postdoctoral Association Annual Conference
* Judge, Undergraduate Research Forums: Ohio State Denman Forum and SACNAS
* Volunteer Reviewer & Committee Member, Kenyon College Fulbright Review Panel

**University and Public Outreach**

* Outreach Team Member, OSU Museum of Biological Diversity Open House
* Zero Waste Volunteer, Ohio Stadium Sustainability Program – performed waste stream audit during football events

**Environmental and Community Engagement**

* Zero Waste Volunteer, Ohio Stadium Sustainability Program – performed waste stream audit during football events
* Volunteer, Friends of the Lower Olentangy Watershed (FLOW) – stream bioassessments
* Planning Committee Member, Sustainable Grandview
* Member, Marble Cliff Community Garden Club
* Participant, Audubon Society Native Plant Backyard Challenge

**Outreach and Inclusion Initiatives**

* Co-authored and submitted an opinion article with Polar Postdoctoral Workshop colleagues outlining a vision for inclusive leadership in Polar science communities.
* Led national survey evaluating how Ecology and Environmental Science mentoring programs support Deaf and Hard-of-Hearing participants; analyzed results to inform best practices.
* Delivered invited talk, “Values and Your Career,” to the University of Minnesota, promoting reflection on career alignment and purpose.
* Actively studying American Sign Language (ASL) and coordinated an online course in Chinese Sign Language to promote multilingual accessibility.
* **Professional Recognition**
* Fulbright Hays DDRA brochure
* Article in BusinessMiami
* “Your Contribution Made a Difference” award, Wal-Mart Stores, Inc.