

HEATHER FAIR
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Education

The Ohio State University (Ohio, USA)	Environmental Science	Ph.D. 2017
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)	Business Management	B.S.B.A.

Appointments

National Science Foundation (NSF) Postdoctoral Research Fellow in Biology, University of Minnesota, Chinese Academy of Sciences, and USDA Agricultural Research Services, Columbus, OH (2021-2024)

- Examining supraglacial moss balls for epiphytic microbial communities and invertebrate communities in multiple developmental stages, Glacier View, Alaska.
- Comparing the microbial communities of supraglacial cryoconite holes and supraglacial pools on the Mendenhall and Matanuska Glaciers, Alaska.
- Researching diversity and species distribution of tardigrades in *Trentepohlia*, moss, and lichen blooms of the temperate monsoonal and plateau climates of Mt. Gongga, Tibet.
- Detailing invertebrates, sediment, and periphyton microbial communities in relationship with habitat variables of hot springs in a tectonic region of southeast Tibet.
- Leading an ESA special session and developing a survey to assess the effectiveness and accuracy of AI interpretation to move towards communication of scientific results in the native languages of the scientist.
- Developed and conducted a survey to understand experiences and challenges of mentoring programs within professional ecological organizations in serving Deaf and hard-of-hearing participants.
- Mentored undergraduate students to perform independent aquatic ecology research projects in the NSF Research Experience for Undergraduates (REU) program.

Instructor, Ohio Wesleyan University, Biology Department, Delaware, OH (1/2020-5/2020)

- 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 on presentations on international response of countries to COVID-19.

Visiting Assistant Professor, Kenyon College, Biology Department, Gambier, OH (8/2019-6/2020)

- Taught experimental biology incorporating biodiversity, RStudio statistical coding and analysis, DNA extraction, PCR, bioinformatics, and gene expression in plant roots.

Visiting Professor, Middlebury College School of the Environment, Yunnan, China (6/2019-7/2019)

- Developed and taught aquatic entomology and guided student projects in conducting fieldwork, scientific tests, data analysis, and authoring scientific reports.
- Co-developed environmental studies course. Taught concepts of water resources, life cycle analysis (LCA), and water policy. Guided students in developing and presenting projects using LCA, time lapse photography, and interviews using water footprint questionnaire interviews with expats and local Chinese.

Sea Grant Knauss Fellow, US Geological Survey, Water Mission Area, Reston, VA (2018-2019)

- Developed initial Value of Information (VOI) project for USGS water quality modeling.
- Served as lead author on Water Mission area chapter in VOI circular “The Value of USGS Science: Information Analysis of Select Information Products.”
- Analyzed USGS research and presented it at Sea Grant/WRI regional leadership meetings.
- Assisted in development and implementation of USGS employee survey.

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Graduate Teaching Assistant, Masters and Ph.D. programs, The Ohio State University (2008, 2010-2017)
1) Human Physiology; 2) Introductory Biology (x2); 3) Neurobiology of Animal Behavior (x2); 4) Field Zoology at Stone Laboratory, Lake Erie; **Lecturer:** 5) bilingual Chinese interpersonal relations course; and 6) Intensive beginning Chinese.

External and Internal Fellowships and Grants, Masters and Ph.D. programs, The Ohio State University
Fulbright-Hays Doctoral Dissertation Research Abroad Grant: (2015) Glacier Stream Conceptual Model and Physiological Mechanisms of Aquatic Insects, Yunnan and Sichuan Tibetan Autonomous Regions, China.
Robert H. Edgerley Toxicology Fellowship (2014 & 2016) Salinity effects on glacial meltwater invertebrates
Department of Education Foreign Language Area Studies fellowship (2012-2013)
Helen M. and Milton O. Lee Aquatic Sciences Fellowship (2011 and 2013)
Fulbright Research Fellow: Conducted international aquatic ecology glacier field research in Tibet (2010-2011)
NSF GK-12 Teaching & Research Fellow, Sugarcreek Watershed at Hiland High school: (2009-2010)
NSF Yunnan IGERT fellowship, University of Wisconsin (2009 and 2010)
NSF East Asian Pacific Summer Institute Fellow (China, 2008 and Taiwan, 2009)

Chinese Department, The Ohio State University (2008)

- Developed global language summit with international companies in Columbus, Ohio

Education Consultant, Reach Student Services, Hong Kong and United States (part-time, 2013-2018)

- Worked with international student applications to community colleges to vertically transfer to universities after two-years at the community college level.
- Assisted high school students with college application essays and English language skills. Successfully coached a student to become accepted into Harvard.

WalMart Stores, Inc. Headquarters, Bentonville, AR (positions listed below) (1999-2007)

Business Strategy Analyst, Global Procurement Division Finance & Strategy Team (2005-2007)

- Initiated Green Bag Luncheon series to educate associates about environmental issues.
- Managed Hyperion Essbase database to support budget and forecasting reporting.
- Developed collaborative relationships with NGOs to determine key environmental projects to drive economic shareholder value while maintaining EDLP (everyday low price) cost structure. Founding team member of Waste and China networks.
- Developed balanced scorecard and marketing packet for \$12 billion division that set the stage for corporate-wide supply chain proposal. Completed 40% ahead of schedule through teamwork, focus, exceptional organization and urgency.

Global Systems Training Manager, Global Procurement and Information Systems (2003-2005)

- Mapped and analyzed purchase order (PO) process and reconfigured using Six-Sigma techniques to reduce PO creation time by 75%.
- Led multi-division effort to revise supplier agreement system to achieve Sarbanes-Oxley Act compliance. Reduced manual work by 50% and coordinated legal, customs, and IS team to implement in 25 offices with 2,000 suppliers in five months.
- Selected by Executive VP to automate digital catalog to leverage US buying decisions to international buy teams. Conceptualized initial platform for an e-bay type of system to enhance ROI.
- Selected by Seiyu conversion team to lead transition training program and was immediately recruited by newly formed sourcing division to lead global systems training program for the Americas, Asia, Europe, Middle East, and India regions.
- Initiated the unifying big picture processes for supplier and private label specification, quotation, and purchase order system. Provided vision to team, and analytical skills to level the field for suppliers and buy teams. Presented at Global Sourcing summits with hundreds of suppliers in attendance.

Expatriate position -Retail Link Training Manager - Tsim Shat Tsui, Hong Kong (2001)

- Served on expatriate assignment during key acquisition period of sourcing division. Expanded supplier development program from 3-months to entire year program.

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- Utilized methods to gather marketing data from systems utilized by 25,000 suppliers.

Retail Link Trainer, Information Systems (1999-2003)

- Developed and delivered Retail Link (teradata) analysis (Sales Analysis, Retail Math, Market Basket, replenishment, and forecasting) and business-critical courses to over 4,500 US, Asian, Indian Sub-Continent, and Middle Eastern suppliers.
- Managed the rollout of systems programs in Korea and China retail markets and delivered corporate value by bringing suppliers into the supply-chain analysis partnership. Supplier involvement increased 0% to 75% within the first year.
- Brought together high caliber suppliers in US, Hong Kong, China, and Brazil to form User Groups to share leading-edge technology, Wal-Mart standards, sourcing information, and keynote presentations.

Travel Grants for Postdoc Meetings

- National Postdoctoral Association Annual Conference and Workshop Award, March 2022

Fellowships Awarded as Graduate Student

- I was awarded **\$242,000 in fellowships** as a graduate student, including: 1) **Sea Grant Knauss Fellowship, US Geological Survey**; 2) **Fulbright-Hays Doctoral Dissertation Research Abroad Grant, Hong Kong University**; 3) **Robert H. Edgerley Environmental Toxicology Fellowship**; 4) **Helen M. and Milton O. Lee Aquatic Sciences Fellowship**, 5) **NSF East Asian Pacific Summer Institute Fellow (Taiwan and China)**, 6) **U.S. Department of Education Foreign Language Area Studies (FLAS) Fellow (Chinese)**, 7) **Fulbright Research Fellowship**, and 8) **NSF GK-12 Teaching & Research Fellow, Sugarcreek Watershed**.

Grants Awarded as Student Principal Investigator/Grant Writer

- As a student PI, I was a successful research grant writer and was awarded **\$151,571 in research funds beyond fellowship funding**. These funds included: Robert H. Edgerley Environmental Toxicology Fund (\$14,371, 2016 and 2014), Columbus Zoo Biodiversity Conservation Grant (3x) (\$19,000, 2010, 2013, 2017), Ohio State Office of International Affairs Travel Grant (\$8,000, 2009, 2013), Sophie Danforth Conservation Award (\$1,200, 2011), University of Wisconsin NSF Yunnan IGERT grant (\$9,000), and OARDC Seeds grant (\$100,000, 2007).

International Field Research Experience and Relevant Skills

- 2008-present: Served in a group of the first scientists to conduct fieldwork post-Moxi earthquake in Mt. Gongga, Ganze Tibetan Autonomous Region, October 2023. Worked with indigenous Tibetans and Chinese scientists within the Chinese Academy of Sciences, and the University of Alaska to design field experiments, collect supraglacial microbial samples, periglacial boulder red algae, moss, and lichen microbial communities, hot spring microbial communities, insects and habitat data in physically-demanding terrain of glaciers, glacial-melt streams, and alpine streams in remote high-altitude circum-Himalayan mountain ranges. Field research included: 1) Cryoconite hole pilot project on supra glacier environment of a debris-covered glacier (2018 & 2019); 2) High-altitude East-West mountain range comparison of glacial-melt stream community ecology, riparian characteristics, and glacial-melt hydraulic habitats at Mt. Gongga (2018); 3) Conducted glacial-melt stream ecology research at Meilixueshan, Yunnan (2009-2015), Mt. Gongga, Sichuan (2008, 2011, 2015, 2018), and Yulongxueshan, Lijiang, Yunnan (2010, 2013, 2015) which included field salinity experiments on glacial-melt and groundwater stream larvae, sacred stream site sampling following indigenous Tibetan customs and beliefs, preparation of aquatic insects to perform microscopy work and laboratory analysis for scanning-electron microscopy imaging at Hong Kong University; and 4) Performed subtropical stream ecology research in mountainous, rocky terrain in Taiwan (2009).

Scientific Publications

Fair, H., T. Hamilton, R. Smiley, Q. Liu. *In Revision*. Determinants of microbial community structure in supraglacial pool sediments of monsoonal Tibetan Plateau. *Microbiology Spectrum*.

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. DOI: 0.1080/15230430.2020.1839165.

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

Donohue, M.J., **Fair, H.** (2019). 10-Year USGS Water Resources Research Act Program Vision: Meeting Imperatives for our Nation's Water Resources. United States Geological Survey, 18p.

Fair, H., D. Dean. *In preparation*. Species Description of Nemouridae nymph and adult from Mt. Kawagebo, Yunnan.

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 Hailuoguo. 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.

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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.

How stability and maturity of Alaskan glacier moss balls influence their microbial and invertebrate communities. 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

- 2023: 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.
- 2022: Mentored zoology major undergraduate in writing successful grant proposal for summer research
- 2022: Mentored DHH student in presenting NSF REU research results at the Ohio Academy of Science
- 2021: 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.

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- 2019: Mentored two undergraduate Kenyon College students in Fulbright applications to Laos & Taiwan and served on Fulbright review panel committee.
- 2013-2017: Mentored 12 undergraduate volunteers in the laboratory with four conducting independent research under my guidance with presentations at undergraduate research forums.

Grant and Journal Article Reviewer

- 2023: Ecological Society of America Excellence in Ecology (EEE) Scholarship selection committee.
- 2018: USGS Water Resources Research Act Program National Competitive Grant Reviewer.
- **Journal reviews:** *BMC Microbiology* (1 manuscript), *Frontiers* (1 manuscript), *International Journal of Environmental Research and Public Health* (2 manuscripts), *Limnology* (2 manuscripts), *Land Processes* (1 manuscript), *Ecological Indicators* (8 manuscripts), *Journal of Environmental Protection* (1 manuscript), *Science of the Total Environment* (1 manuscript).

Other Skills

- **Statistics:** Proficiency in R Studio statistical coding, Dada2, Phyloseq, SPSS, PCORD multivariate statistical package, Sigma Plot statistical graphing software, and Minitab.
- **Computer program skills:** Supercomputing, bioinformatics, Fiji (ImageJ), Visio process flow software, Adobe InDesign, ERDAS Remote Sensing, Chinese language software.
- **Field and laboratory skills:** eDNA sampling methods, qPCR techniques, scanning electron microscopy (SEM), transmission electron microscopy (TEM), chironomid mounting and identification.
- **Language skills:** Mandarin Chinese - advanced level (ACTFL Oral Proficiency Review); Spanish, beginner, American Sign Language (ASL) - intermediate. Chinese Sign Language (beginning)

Professional Societies

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

Service to Professional Societies, Universities/Colleges, and Community

- Committee Member, Ecological Society of America Diversity, Equity, Inclusion & Justice (2023-2025)
- NSF Polar Science Early Career Community Office 2023 Polar Postdoctoral Leadership Workshop planning committee volunteer and participant, Jan. 2023-June 2023, Boulder, Colorado.
- Sustainable Grandview planning committee, (2022-present)
- Audobon Society Native Plant Backyard Challenge, (2023)
- Ecological Society of America volunteer mentor and undergraduate poster judge, (2022, 2023)
- Abstract Judge, Society for Advancement of Chicanos/Hispanics & Native Americans in Science, (2022)
- Poster Judge, National Postdoctoral Association Annual Conference, (2022)
- Research Poster Judge, Undergraduate Research Posters, Society for the Advancement of Chicanos/Hispanics, and Native Americans in Science (2021)
- Volunteer Reviewer, Kenyon Fulbright applicants and served on Fulbright review panel committee.
- Served on outreach team for Museum of Biological Diversity Open House (2013, 2016).
- Served as judge for The Ohio State Univ. Denman Undergraduate Research Forum (2014, 2016).
- Volunteered at Ohio Stadium for “Zero Waste” football events, performed waste stream audit.

Diversity, Equity, Accessibility, and Inclusion

- Writing a DEI opinion piece with Polar postdoctoral workshop colleagues to put out our vision for the Polar research community and leadership in a scientific journal.
- Conducted a survey examining experiences of Ecology and Environmental Science Mentoring Programs in serving Deaf and Hard-of-hearing participants.

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- Presented “Values, DEI, and Your Career” to University of Minnesota Hamilton Lab group.
- Learning American Sign Language and coordinated Chinese Sign Language online course.
- Researching and writing Wikipedia pages for mid frequency sensorineural hearing loss

- **Professional Recognition**
- Fulbright Hays DDRA brochure (2015-2018)
- Article in BusinessMiami, 2006
- “Your Contribution Made a Difference” award, Wal-Mart Stores, Inc. 2002