Ken Gunter Sweat

School of Mathematical and Natural Sciences

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## **Education:**

**Doctor of Philosophy**: Plant Biology, Arizona State University, May 2010. Biomonitoring of Elemental Atmospheric Deposition with the Lichen *Xanthoparmelia* *spp.* in Arizona, USA.

**Master of Science**: Botany, Arizona State University, December 1995. The Long-Term Effects of Fire on Cactus Communities of the Sonoran Desert of Arizona.

**Bachelor of Arts**: Biology/Mathematics, Claremont McKenna College, May 1990. Plant Population Dynamics: The Effects of Offspring Dispersal and Spatial Density Variation on Interspecific Competition.

## **Current Teaching and Research:**

**Principal Lecturer.** Arizona State University’s west campus; Phoenix, Arizona; 7/2018 - present. **Senior Lecturer.** 5/2010 – 7/2018. **Lecturer.** 8/2000 – 5/2010.

**Teaching:**

Faculty member responsible for curriculum content and facilitating the use of the curriculum by teaching staff for all laboratory sections of General Biology 1 & 2 (BIO 181/182). Teaching and curriculum development for General Biology (BIO 181/182/187/188), Research for the Natural Sciences (LSC 388), Biometry (BIO 415), Modes of Biological Thought (BIO 306), Flora of Arizona (PLB 310), Fundamentals of Ecology Laboratory (LSC 322), Natural History of Arizona (BIO 300/301), Field Techniques in Wildlife Conservation Biology (BIO 410), Plants and Civilization (PLB 302) and Plant Diversity and Evolution (PLB 300). Developed Forensic Botany course lecture and laboratory and an integrated curriculum for Biometry and Invertebrate Biology (BIO 385).

**Community Engagement and Departmental Service:**

Adult lifelong learning classes developed and taught for Osher Lifelong Learning Institute at ASU’s west and downtown campuses, the Desert Botanical Gardens and Encore University. Course topics include forensic botany, fungi, antibiotic resistance, sex, evolution and creationism, ethnobotany, agriculture and food production, and the politics of global warming. Service to the department has included serving as west campus senate president elect for 2018-2019, chairing the first-year course curriculum committee, serving on multiple faculty search committees and the salary equity committee.

**Student Engagement through Research:**

Student lead research projects have included multiple studies in phytoremediation of metal contaminated soils, techniques in forensic botany and mycology, capsaicinoid extractions of hot peppers, crayfish respiration, and bioassays of herbicides.

# Publications (undergraduate coauthor):

Sweat, K.G., P.A. Marshall, J.L. Foltz-Sweat, & J.E. Broatch. 2018. Developing a Course Based Research Experience for Undergraduates: The ASU West Experience. Journal of the Arizona-Nevada Academy of Sciences. 47(2):36-43.

Sweat, K.G., J. Broatch, C. Borror, K. Hagan, & T. Cahill. 2016. Variability in capsaicinoid content and Scoville heat ratings of commercially grown Jalapeño, Habanero and Bhut Jolokia peppers. Food Chemistry. 210: 606-612.

Gremillion, P.T., E. Hermosillo, **K.G. Sweat**, and J.V. Cizdziel, 2013. Variations in mercury concentration within and across *Xanthoparmelia spp.* individuals: Implications for evaluating histories of contaminant loading and data interpretation. Environmental Chemistry.10(5):395-402. 25 October.

Riddell, J., S. Jovan, P.E. Padgett and **K.G. Sweat**. 2011. Tracking lichen community composition changes due to declining air quality over the last century: the Nash legacy in Southern California. Bibliotheca Lichenologica. 106: 263-277.

Sweat, K.G., P. T. Gremillion and T.H. Nash. 2010. Mercury concentrations in the lichen *Xanthoparmelia spp.* in the greater Grand Canyon region of Arizona, USA. Bibliotheca Lichenologica. 105: 93-102.

Bates, S.T., T.H. Nash, **K.G. Sweat**, and F. Garcia-Pichel. 2010. Fungal communities of lichen-dominated biological soil crusts: Diversity, relative microbial biomass, and their relationship to disturbance and crust cover. Journal of Arid Environments.74:1192-1199.

Divakar, Pradeep K., A. Crespo, F. Kauff, R. Del Prado, S. Perez-Ortega, G. Amo De Paz, Z. Ferencova, O. Blanco, A. Arguello, A. Millanes, M. C. Molina, M. P. Normore, M. A. Wedin, A. Aptroot, F. Bungartz, S. Calvelo, M. Candan, M. Cole, J. A. Elix, D. Ertz, B. Goffinet, A. Knight, J. Lendemer, L. Lindblom, R. Luecking, F. Lutzoni, J. Mattsson, M. I. Messuti, G. Perlmutter, V. J. Rico, T. Spribille, U. P. Steffen, **K. Sweat**, A. Thell, G. Thor, G. Urbanavichus, and T. Lumbsch. July 2008. New systematics and generic circumscription or parmelioid lichens inferred from multigene analysis provided by PARSYS-08. Paper presented at the 6th IAL Symposium and Annual ABLS meeting. Pacific Grove, Ca., USA

Marshall, P.A. and **K. G. Sweat**. 2008. Integrating Mathematics into Microbiology: Statistical Analysis of Biology Community Level Phenotype Profiling. Journal of the Arizona-Nevada Academy of Sciences. 40(2):157-159.

Sweat, K.G., W. A. Iselin, S. T. Bates and T.H. Nash III. 2004. The Lichens of Parashant National Monument, Arizona: A Preliminary Study. Journal of the Arizona-Nevada Academy of Science 37(2):85-90.

# Grants:

CURE as a Research Experience for All: Preparing the Future STEM Workforce. Marshall, P.A., Broatch, J., Cahill, T.C., Foltz-Sweat, J.L., **Sweat, K.G**. NSF 15-585 (7/1/2016 – 6/30/2019).

An Integrated Core Curriculum of Cell Biology, Genetics, and Ecology Using the Desert Tree Lizard as a Thematic Organism. Dennis, D.E., Deutch, C., Kwiatkowski, M.A., Marshall, P.A., **Sweat, K.G.** NSF-EHR(9/15/2004 – 8/31/2007).

Development of Laboratory Experiments and Lecture Material for the Introductory Biology course (BIO 187/188). Internal Staff Development Grant. Arizona State University’s west campus. Summer 2002.

# Research Posters and Presentations (undergraduate coauthor):

Johnson, K., R. Wetle, M. Yakubov, B. Bensko-Tarsitano, J. Ripley, T. Cahill, & **K. Sweat**. 2018. The Phytoremediation Potential of Four Plant Species Native to Arizona on Uranium Contaminated Soil. Poster presented at the 2018 Arid Lands Conference in Scottsdale, Arizona and at the ASU New College of Interdisciplinary Arts and Sciences Symposium Spring 2018. Phoenix, Az.

F.M. Bellows, A.B. Kortman, A.L. Maney, J.G. Ochoa, S.P. Wetle, & **K. Sweat**. 2018. Strategies for Phytoremediation of Arsenic and Lead Contaminated Soils. Poster presented at the ASU New College of Interdisciplinary Arts and Sciences Symposium Spring 2018. Phoenix, Az.

Gutierrez, A., J. Nguyen, & **K. Sweat**. 2018. Aerobiological Sampling of Pollen for Forensic Site Differentiation. Poster presented at the ASU New College of Interdisciplinary Arts and Sciences Symposium Spring 2018. Phoenix, Az.

Johnson, K., C. Weum, J. Mullins, & **K. Sweat**. 2018. Assessment of Potential Botanical Poisons Available in the Phoenix Metropolitan Area. Poster presented at the ASU New College of Interdisciplinary Arts and Sciences Symposium Spring 2018. Phoenix, Az.

Hathorne, C., T. Hibben, Z. Goldberg, & **K. Sweat**. 2018. Fungal Growth and Succession: Light and Humidity on Porcine Carrion Decay and PMI Estimation. Poster presented at the ASU New College of Interdisciplinary Arts and Sciences Symposium Spring 2018. Phoenix, Az.

Sandoval, A., M. Bugarin, K. Solis, & **K. Sweat**. 2018. Analysis of Diatoms for Use in Estimation of Post Disposal Interval (PDI). Poster presented at the ASU New College of Interdisciplinary Arts and Sciences Symposium Spring 2018. Phoenix, Az.

Marshall, P. A., J. Broatch, T. Cahill, J. Foltz-Sweat, and **K. Sweat**. 2017. Interdisciplinary Course Based Undergraduate Research Experiences. Poster presented at the Gordon Research Conference Visualization in Science and Education. August 2017. Lewiston, ME.

Gutierrez, A., S. Avezov, A. Terrien, M. Boros, M. Abbey, and **K. Sweat**. Differential Effects of Metal Toxicity on *Prosopis juliflora* Growth. Poster presented at the ASU New College of Interdisciplinary Arts and Sciences Symposium Spring 2017. Phoenix, Az. 2nd Place Best Presented Research or Creative Project.

K. Stromberg, K. Bergin, A. Kulinec, J. Young, and **K. Sweat**. Phytoremediation technology: Effects of metals on the germination of *Larrea tridentata*. Poster presented at the ASU New College of Interdisciplinary Arts and Sciences Symposium Spring 2017. Phoenix, Az. 3rd Place Best Presented Research or Creative Project.

Ryan, K., S. Rivera, J. Ehrlich, D. Espinoza, R. Foster, D. Gaytan, K Haenitsch, B. Kelvington, K. King, A. Mendoza, A. Poole, and **K. Sweat**. 2016. Using Chlorosis to Determine the Post Disposal Interval (PDI). Poster presented at the ASU New College of Interdisciplinary Arts and Sciences Symposium Spring 2016. Phoenix, Az.

Sweat, K.G., J.L. Foltz-Sweat, P. A. Marshall & T. Cahill. 2016. Development of a Course-Based Research Experience at the West Campus of ASU. Poster presented at the Learning Innovation Showcase. ASU Tempe campus January 2016.

Kepler, L., T. Cahill and K. Sweat. 2016. Effects of Colchicine-Induced Polyploidy. Poster presented at the ASU New College of Interdisciplinary Arts and Sciences Symposium Spring 2016. Phoenix, Az. 1st Place-Best Non-Presented Research or Creative Project

Yellowhair, B., Sweat, K.G., Gonzales, D., Prieto, C., Tavizon, A.M. March 2004. Bioassay for 2,4-D: Interaction of NaOH – Phase II. Poster presented at the Western Alliance to Expand Opportunities (WAESO) conference, ASU, Tempe, Az

Sweat, K.G. and Santiago, L. June 2003. Using Organismal Biology to Facilitate Teaching Statistical Techniques in the Life Sciences. Presented at the 2003 Hawaii International Conference on Statistics, Mathematics and Related Fields. Honolulu, Hi

Tavizon, A., K. Sweat, D. Gonzales, M. Arballo, and B. Yellowhair. November 2002. Bioassay for 2-4,D. Poster presented at the ABRCMS, New Orleans, La.

## **Professional Development:**

## Disciplinary Based Education Research (DBER) Design and Implementation. Fall 2017.

Online course offered by American Society for Microbiology. The course offered advice and strategies to develop research studies on learning and teaching in science courses.

## An Introduction to Evidence-Based STEM Undergraduate Teaching. Summer 2017

## Online course offered through edX. The course offered advice, research findings, and guidance on developing a curriculum that incorporates active learning into STEM courses.

## **Invited Presentations:**

Sweat, K. G. 2017. “Quantifying mine soil toxicity by undergraduates in a research course.” Presented at the Society of Environmental Toxicology and Chemistry North America 38th Annual Meeting. Minneapolis, Minnesota. November 16, 2017

“The Magic of Mushrooms.” Desert Botanical Garden. September 30, 2015. Phoenix, Arizona.

“Human Caused Climate Change: What Does Science Tell Us?” Oceanscape VI Continuing Medical Education Conference. July 25, 2015. Newport Coast, California.

Panelist for post screening discussion: “Chasing Ice” ASU Downtown campus. April 22, 2014. Sponsored by ASU Sustainability Practices. Phoenix, Arizona

“Human–Induced Climate Change: the Science and the Spin.” Central Arizona Chapter of the Society for Conservation Biology, Arizona State University Tempe campus. November 13, 2012. Tempe, Arizona.

“Lichen Diversity and Uses for Environmental Monitoring” National Geographic BioBlitz, Saguaro National Park. October 22, 2011. Saguaro National Park, Arizona.

“Riparian Ecology in the Sonoran Desert.” McDowell Sonoran Conservancy. March 31, 2008. Salt River, Arizona.

“Endangered Species of the American Southwest.” Arizona Science Center – Adults’ Night Out. September 1, 2006. Phoenix, Az.

“Evolution: Everything you wanted to know but did not know who to ask.” The Secular Freethought Society of ASU. February 26, 2006. Arizona State University’s Tempe campus, Tempe, Az.

“Lichens as Biomonitors of Heavy Metal Air Pollution.” (with S.T. Bates and W. A. Iselin.) ASU Conservation Club. October 2003. Arizona State University, Tempe, Az.

# Previous Teaching, Research and Employment:

**Assistant Director**: Bridges to Baccalaureate Program, ASU West. 1/05-1/06. Assisted director and coordinator on drafting grant renewal and other administrative tasks. Developed and taught curriculum for mathematics/statistics course, PCR laboratory exercise and botany research laboratory with projects involving bioassays, taxonomy and ethnobotany.

**Adjunct Faculty.** Estrella Mountain Community College. 1/2014 – 5/2016; 8/1999 – 12/2001. Paradise Valley Community College; 8/2009 - 12/2012. Mesa Community College; 8/1998 - 10/1998.

Taught and developed curricula for General Biology (181/182), Environmental Biology (BIO 105), Natural History of the Southwest (BIO 109/110), Biology for Allied Health Majors (BIO 156) and Biology for Nonmajors (BIO 100) lecture and laboratory in traditional and hybrid settings.

**Senior Natural Resources Specialist.** Gutierrez-Palmenberg, Inc.; U.S. Army Yuma Proving Ground; 11/98 - 8/99.

Supervised all contracted natural resource management tasks including: draft and revision of environmental documents by interdisciplinary teams; installation-wide invertebrate survey; and all aspects of the YPG hunting program.

**Contract Biologist.** Self-employed; various locations; 6/94 – 9/2000.

Work included natural resource surveys for multiple species (e.g. the spotted owl and desert tortoise) protected under federal, state or local laws, environmental monitoring, natural resource database management and analysis of environmental documents.

## **Awards and Certificates**

Outstanding Teaching non-tenure track faculty 2016-2017. New College of Interdisciplinary Arts and Sciences.

Faculty of the Year: STEM TRIO ASU’s west campus. 2016.

Technology Fellowship-Summer 2002. ASU at the west campus.

Lifetime Certification-MCCCD Community College Biology Instructor - Arizona.

Honorary Member Sigma Xi Society.