CURRICULUM VITAE

Dr. Hong Zhang

Department of Chemistry
Tennessee Tech University
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EDUCATION AND TRAINING

Postdoctoral Experience, Environmental Chemistry, *2001*, **Oak Ridge National Laboratory**
Research: Environmental chemistry of mercury: Transport, transformation, and cycling

Ph.D., Soils & Environmental Chemistry, *1998*, **University of Vermont**
Dissertation: Photochemical redox interactions of Fe with Cr, NO_2^-, Mn, and organic acids

PROFESSIONAL EXPERIENCES

Professor, *August, 2011*
Tenured, *August 2007*
Associate Professor, *August 2006 – July 2011*
Assistant Professor, *August 2002 – July 2006*
Tennessee Tech University (TTU), Cookeville, Tennessee

Major research interests include physical and chemical processes, kinetics, and molecular mechanisms of transport, transformation, fate, and cycling of natural chemical substances and pollutants in the environment crossing air, water, plant, and soil on local, regional, and global scales, and environmental modeling.

Assistant Research Scientist (Research Faculty), *February 2001– July 2002*
University of Michigan, Ann Arbor, Michigan

Research: Environmental chemistry, photochemodynamics of aquatic Hg in Saginaw Bay, MI.

Postdoctoral Research Scientist, *March 1998 – January 2001*
Oak Ridge National Laboratory (ORNL), Oak Ridge, Tennessee

Research: Focused on environmental chemistry, involving photochemical redox transformations of mercury (Hg) in waters and soils and the atmosphere; Hg air/soil exchange; Hg air/water exchange; Hg speciation in the atmosphere, water, and soil; Hg regional and global budget and cycling; field measurement methods for Hg air/surface exchange; transformation and fate of Hg in the environment; Hg environmental modeling.

Graduate Research Fellow, *September 1992 – December 1997*
University of Vermont, Burlington, Vermont

Research: Focused on environmental photochemistry, particularly photochemical redox transformations of iron, chromium, manganese, nitrite, and organic acids in water and soils.

RESEARCH ARTICLES PUBLISHED IN PEER-REVIEW JOURNALS

[38] Fletcher, LS., Crocker, W.C, Zhang, H. Chemodynamics of Mercury (Hg) in a Southern Reservoir Lake (Cane Creek Lake, Cookeville, TN, USA): I. Estimation of the kinetics of photochemical reduction of aquatic Hg(II) using field-measured data of Hg water/air exchange and dissolved gaseous Hg. ***Water***, *15*(1), 199; **https://doi.org/10.3390/w15010199**, **2023**.

[37] Crocker, W.C., Zhang, H. Seasonal and diurnal variation of air/water exchange of gaseous mercury in a southern reservoir lake (Cane Creek Lake, Tennessee, USA). ***Water***, **12**, 2102; doi:10.3390/w12082102, **2020**.

[36] Li, J., Xu, R., Zhang, H. Iron oxides serve as natural anti-acidification agents in highly weathered soils. ***J. Soils Sediments***, **12**, 876-887, **2012**.

[35] Yuan, J., Xu, R., Zhang, H. The forms of alkalis in the biochar produced from crop residues at different temperatures. ***Bioresource Technology***, **102**, 3488-3497, **2011**.

[34] Senevirathna, Wasana U., Zhang, H., Gu, B. Effect of carboxylic and thiol ligands (oxalate, cysteine) on the kinetics of desorption of Hg(II) from kaolinite. ***Water, Air & Soil Pollution,*** **215**, 573-584, **2011**.

[33] Stamenkovic, J., Weisberg, P., Pillai, R., Ericksen, J., Kuiken, T., Lindberg, S., Zhang, H., Rytuba, J., Gustin, M. Application of a rule-based model to estimate mercury exchange for three background biomes in the continental United States. ***Environmental Science & Technology***, **43**, 4989-4994, **2009**.

[32] Natali, S.M., Sanudo-Wilhelmy, S.A., Norby, R.J., Zhang, H., Finzi, A.C., Lerdau, M.T. Increased mercury in forest soils under elevated carbon dioxide. ***Oecologia*****, 158**, 343-354, **2008**.

[31] Zhang, H., Lindberg, S., Kuiken, T. Mysterious diel cycles of mercury emission from soils held in the dark at constant temperature. ***Atmospheric Environment*** , **42**, 5424-5433, **2008**.

[30] Zhang, H., Dill, C. Apparent rates of production and loss of dissolved gaseous mercury (DGM) in a southern reservoir lake (Tennessee, USA). ***The Science of The Total Environment***, **392**, 233-241, **2008**.

[29] Kuiken, T., Zhang, H., Gustin, M., Lindberg, S. Mercury emission from terrestrial background surfaces in the eastern USA: I. Air/surface exchange of mercury within a southeastern deciduous forest (Tennessee) over one year. ***Applied Geochemistry***, **23**, 345-355, **2008**.

[28] Kuiken, T., Gustin, M., Zhang, H., Lindberg, S., Sedinger, B. Mercury emission from terrestrial background surfaces in the eastern USA: II. Air/surface exchange of mercury within forests from South Carolina to New England. ***Applied Geochemistry***, 23, 356-368, **2008**.

[27] Xu, R.K., Xiao, S. C., Zhang, H., Jiang, J., Ji, G.L. Adsorption of phthalic acid and salicylic acid by two variable charge soils as influenced by sulfate and phosphate. ***European Journal of Soil Science***, **58**, 335-342, **2007**.

[26] Zhang, H, Dill, C, Kuiken, T, Ensor, M, Crocker, W. Change of Dissolved Gaseous Mercury (DGM) Concentrations in a Southern Reservoir Lake (Tennessee, USA) Following Seasonal Variation of Solar Radiation. ***Environmental Science & Technology***, **40**, 2114-2119, **2006**.

[25] Gabriel M, Williamson G, Brooks, S, Zhang H, Lindberg S. Diurnal and seasonal trends in total gaseous mercury flux from three urban ground surfaces. ***Atmospheric Environment***, **40**, 4269-4284, **2006**.

[24] Xu, R.-K., Wang, Y.-Y., Zhao, A.-Z., Ji, G.-L., Zhang, H. Effect of low-molecular-weight organic acids on adsorption and desorption of fluoride on variable charge soils. ***Environmental Geochemistry and Health*****, 28**, 131-136, **2006.**

[23] Dill C, Kuiken T, Zhang H., Ensor M. Diurnal Variation of Dissolved Gaseous Mercury (DGM) Levels in a Southern Reservoir Lake (Tennessee, USA) in relation to solar radiation. ***The Science of The Total Environment*****, 357**, 176-193, **2006.**

[22] Gabriel M, Williamson G, Brooks, S, Zhang H, Lindberg S. Spatial variability of mercury emissions from soils in a southeastern US urban environment. ***Environmental Geology***, **48**, 955-964, **2005.**

[21] Marsik, F., Keeler, G., Lindberg, S., Zhang, H. The air-surface exchange of gaseous mercury over a mixed sawgrass-cattail stand within the Florida Everglades. ***Environmental Science & Technology***, **39**, 4739-4746, **2005**.

[20] Southworth, G., Lindberg, S.E., Bogle, M.A., Zhang, H., Kuiken, T., Price, Reinhart, D., and Sfeir, H. Airborne emissions of mercury from municipal solid waste II: Potential losses of airborne mercury prior to landfill. ***Journal of Air & Waste Management Association***, 55:870-877, **2005**.

[19] Lindberg, S.E., Southworth, G.R., Bogle, M.A., Blasing, T.J., Zhang, H., Kuiken, T., Price, J., Reinhart, D., Sfeir, H., Owens, J., Roy, K. Airborne emissions of mercury from municipal solid waste I: New measurements from sixoperating landfills in Florida. ***Journal of Air & Waste Management Association***, 55:859-869, **2005**.

[18] Southworth, G.R., Lindberg, S.E., Zhang, H., Anscombe, F.R. Fugitive mercury emissions from a chlro-alkali factory: Sources and fluxes to the atmosphere. ***Atmospheric Environmenet,*** **38**, 597-611, **2004**.

[17] Gustin, M.S., Coolbaugh, M., Engle, M., Fitzgerald, B., Keislar, R., Lindberg, S.E., Nacht, D., Quashnick, J., Rytuba, J., Sladek, C., Zhang, H., Zehner, R. Atmospheric mercury emissions from mine wastes and surrounding geologically enriched terrains. ***Environmental Geology***, ***43***, 339-351, **2003**.

1999 – 2002 (Before Appointment at TTU)

[16] Zhang, H., Lindberg, S., Barnett, M., Vette, A., Gustin, M. Dynamic flux chamber measurement of gaseous mercury emission fluxes over soils: I. Simulation of gaseous mercury emissions from soils using a two-resistance exchange interface model. ***Atmospheric Environment***, ***36***, 835-846, **2002**.

[15] Lindberg, S., Zhang, H., Vette, A., Gustin, M., Barnett, M., Kuiken, T. Dynamic flux chamber measurement of gaseous mercury emission fluxes over soils: II. Effect of flushing flow rate and verification of a two-resistance exchange interface model. ***Atmospheric Environment***, ***36***, 847-859, **2002**.

[14] Zhang, H., Lindberg, S. Trends in dissolved gaseous mercury in the Tahquamenon river watershed and nearshore waters of Whitefish Bay in the Michigan Upper Peninsula. ***Water, Air & Soil Pollution***, ***133***, 379-389, **2002**.

[13] Engle, M., Gustin, M., Zhang, H. Quantifying natural source mercury emissions from the Ivanhoe Mining District, north-central Nevada, USA. ***Atmospheric Environment,35***, 3987-3997, **2001**.

[12] Zhang, H., Lindberg, S. Sunlight and Fe(III)-induced photochemical production of dissolved gaseous mercury in freshwater. ***Environmental Science & Technology***, ***35***, 928-935, **2001**.

[11] Zhang, H., Lindberg, S., Marsik, F., Keeler, G. Mercury air/surface exchange kinetics of background soils of the Tahquamenon river watershed in the Michigan Upper Peninsular. ***Water Air Soil Pollution***, ***126***, 151-169, **2001**.

[10] Ross, D., Bartlett, R., Zhang, H. Photochemically-induced formation of the "Al_{13}" tridecameric polycation in the presence of Fe(III) and organic acid. ***Chemosphere***, ***44***, 827-832, **2001**.

[9] Zhang, H., Lindberg, S. Air/water exchange of mercury in the Everglades I: The behavior of dissolved gaseous mercury in the Everglades Nutrient Removal Project. ***The Science of The Total Environment***, ***259***, 123-133, **2000**.

[8] Lindberg, S., Zhang, H. Air/water exchange of mercury in the Everglades II: Measuring and modeling evasion of mercury from surface waters in the Everglades Nutrient Removal Project. ***The Science of The Total Environment***, ***259***, 135-143, **2000.**

[7] Gustin, M., Lindberg, S., Austin, K., Coolbaugh, M., Vette, A., Zhang, H. Assessing the contribution of natural sources to regional atmospheric mercury budgets. ***The Science of The Total Environment***, ***259***, 61-71, **2000**.

[6] Zhang, H. Light and iron(III)-induced oxidation of chromium(III) in the presence of organic acids and manganese(II) in simulated atmospheric water. ***Atmospheric Environment***, ***34***, 1633-1640, **2000**.

[5] Zhang, H., Bartlett, R. Light-induced disappearance of nitrite in the presence of iron(III). ***Chemosphere***, ***40***, 411-418, **2000**.

[4] Zhang, H., Lindberg, S. Processes influencing the emission of mercury from soils: a conceptual model. ***Journal of Geophysical Research***, ***104***, 21889-21896, **1999**.

[3] Lindberg, S., Zhang, H., Gustin, M., Vette, A., Owens, J., Marsik, F., Casimir, A. Ebinghaus, R., Edwards, G., Fitzgerald, C., Kemp, J., Kock, H., London, J., Majewski, M., Poissant, L., Pilote, M., Rasmussen, P., Schaedilich, F., Schneeberger, D., Sommar, J., Turner, R., Walschlaeger, D., Xiao, Z. Increases in mercury emissions from desert soils in response to rainfall and irrigation. ***Journal of Geophysical Research***, ***104***, 21879-21888, **1999**.

[2] Gustin, M., Lindberg, S., Marsik, F., Casimir, A., Ebinghaus, R., Edwards, G., Fitzgerald-Hubble, C., Kemp, R., Kock, H., Leonard, T., London, J., Majewski, M., Owens, J., Pilote, M., Poissant, L., Rasmussen, P., Schaedlich, F., Schneeberger, D., Schroeder, W., Sommar, J., Turner, R., Vette, A., Walschlaeger, D., Xiao, Z., Montecinos, C., Zhang, H. The Nevada SToRMS project: towards scaling up mercury emissions from natural enriched surfaces. ***Journal of Geophysical Research***, ***104***, 21831-21844,**1999**.

[1] Zhang, H., Bartlett, R. Light-induced oxidation of aqueous chromium(III) in the presence of iron(III). ***Environmental Science & Technology***, ***33***, 588-594, **1999**.

PRESENTATIONS AT PROFESSIONAL CONFERENCES

[56] Zach Rush, Zoe Penn, Hong Zhang. Microbially Mediated Generation of Floating Iron (Fe) (oxy)hydroxide-oxide Film in Inundated Soils: A Preliminary Laboratory Study. TTU Creative Research and Inquiry Day, **April 2022** (poster).

[55] Kami Dunn, Sydney Asmus, Carolyn Cooke, Zach Cord, Shawna Coulter, Chance Morris, Hong Zhang. Abiotic Generation of Floating Iron (Fe) Hydroxide Film with Rainbow Reflection: A Preliminary Hypothesis Testing Study. TTU Creative Research and Inquiry Day, **April 2022** (poster).

[54] Lesta S. Kocher and Hong Zhang. Mechanism and kinetics of superoxide-mediated Hg(II) reduction. 131th Meeting of the Tennessee Academy of Science, Cookeville, TN. **November 6, 2021** (oral).

[53] Hong Zhang and Todd Kuiken. Mercury emission from background soils: Is the soil a source or sink for mercury? 131th Meeting of the Tennessee Academy of Science, Cookeville, TN. **November 6, 2021** (oral).

[52] Kocher, L.S., and Zhang, H. A study on the spectrophotometric analysis of Hg(II) using dithizone under conditions pertinent to Hg(II) reduction in aquatic systems. 14th International Conference on Mercury as a Global Pollutant, Krakow, Poland. **September 2019** (poster).

[51] Kocher, L., Crocker, W.C., Zhang, H.. Estimation of the rate constants of photochemical generation of dissolved gaseous mercury (DGM) in a lake using a simple mass balance model: A preliminary study. American Chemical Society 251th Annual Meeting, **April 2016** (oral).

[50] Kocer, L., Crocker, W.C., Zhang, H. Adaptation of a mass balance model to estimate and evaluate the rate constants of mercury (Hg(II)) photoreduction in a lake. SERMACS Annual Meeting, **November 2016** (oral).

[49] Ragon J, Zhang, H.. A Study on UV-Vis Spectroscopic Characteristics of Soil Humic Substances. American Chemical Society 249th Annual Meeting, Denver, CO, **April 2015** (poster).

[48] Andreasen, Z., Okine, S.O., Zhang, H., Gu, B. Quantitative study of the effect of humic acids on spectrophotometric analysis of Hg(II) using dithizone. American Chemical Society 245th Annual Meeting, New Orleans, LA, **April 2013** (poster).

[47] Okine, S.O, Zhang, H., Gu, B. Photochemical reduction of divalent mercury by humic acid and UVB at pH of 7-9. SERMACS 2012, Raleigh, NC, **November 2012** (poster).

[46] Okine, S.O, Zhang, H., Gu, B. Photochemical reduction of aqueous divalent mercury in the presence of humic acids and UVB. American Chemical Society 243th Annual Meeting, San Diego, CA, **March 2012** (poster).

[45] Andreasen, Z., Zhang, H., Gu, B. Effect of humic acid on spectrophotometric analysis of divalent mercury using dithizone. American Chemical Society 243th Annual Meeting, San Diego, CA, **March 2012** (undergraduate poster).

[44] Andreasen, Z., Zhang, H. A study of photochemical reaction of humic acids and divalent mercury using UV-Vis spectroscopy. American Chemical Society 241th Annual Meeting, Anaheim, CA, **March 2011** (undergraduate poster).

[43] Thompson, C. Zhang, H. a A fate of atmospheric deposited mercury: Adsorption of divalent mercury by soils through leaching. American Chemical Society 241th Annual Meeting, Anaheim, CA, **March 2011** (undergraduate poster).

[42] Okine, S.O. Zhang, H. Refine of the Spectrophotometric analysis of Hg (II) using dithizone. Tennessee Academy of Science Annual Meeting, Cookeville, TN, **November, 2010** (oral).

[41] Okine, S.O. Zhang, H. Photochemical reduction of Hg (II) by humic acid: A preliminary study. Tennessee Academy of Science Annual Meeting, Cookeville, TN, **November, 2010** (poster).

[40] Thompson, C. Zhang, H. Adsorption of atmospheric mercury (Hg(II)) by top soil through leaching of rain water: A laboratory simulation study. Tennessee Academy of Science Annual

Meeting, Cookeville, TN, **November, 2010** (poster).

[39] Andreasen, Z., Zhang, H. UV-Vis absorbance of humic acids exposed to UVB light: A preliminary study. Tennessee Academy of Science Annual Meeting, Cookeville, TN, **November, 2010** (poster).

[38] Liu, T., Zhang, H., Gu, B. Oxidation of elemental mercury by Fenton's reagents. American Chemical Society 239th Annual Meeting, San Francisco, CA, **March 2010** (poster).

[37] Senevirathna, W.U., Zhang, H., Gu, B. Effect of Oxalate and cysteine on adsorption of Hg(II) on kaolinite. American Chemical Society 238th Annual Meeting, Washington, DC, **August 2009** (oral).

[36] Sims, A., Zhang, H. A study of effect of solvent polarity on kinetics of hydrolysis of micromolar ferric iron. American Chemical Society 237th Annual Meeting, Salt Lake City, UT, **March 2009** (undergraduate poster).

[35] Kuiken, T., Zhang, H. A laboratory study of mercury air/soil exchange using mercury-free carrier gas. The 60th Southeast Regional Meeting ACS, Nashville, TN, **November, 2008** (poster).

[34] Zhang, H., Kuiken, T. Mercury emission from terrestrial background surfaces in the eastern USA: Air/surface exchange of mercury from an open field site. Tennessee Academy of Science Annual Meeting, Lebanon, TN, **November, 2007** (poster).

[33] Holbrook, S., Zhang, H. A Kinetic study of hydrolysis of micromolar aqueous $FeCl_3$ using a redox analysis. American Chemical Society 233rd Annual Meeting, Chicago, IL, **March 2007** (undergraduate poster).

[32] Kuiken, T., Zhang, H., Gustin, M., Lindberg, S. Natural background levels of mercury from an eastern deciduous forest floor: A yearlong study within Standing Stone State Forest in Overton County, Tennessee. *8th International Conference on Mercury as a Global Pollutant ,* Madison Wisconsin, USA, **August, 2006** (poster).

[31] Kuiken, T., Sedinger, B., Zhang, H., Gustin, M., Lindberg, S. Air-forest floor mercury exchange along the eastern seaboard and New England. *8th International Conference on Mercury as a Global Pollutant ,* Madison Wisconsin, USA, **August, 2006** (poster).

[30] Crocker C., Zhang, H.*, Kuiken, T. Air/surface exchange of gaseous mercury in Cane Creek Lake of Putnam County (TN). East Tennessee Ozone Study 2006 Science Workshop, Oak Ridge, TN, **May, 2006** (poster).

[29] Kuiken, T., Zhang, H. Mercury air/surface exchange within deciduous forests: Implications for scaling and modeling. East Tennessee Ozone Study 2006 Science Workshop, Oak Ridge, TN, **May, 2006** (poster).

[28] Kuiken, T, Zhang, H, Lindberg, S, Mercury emissions from non-enriched sites: Policy implications and its effect on determining the global mercury budget. American Chemical Society 231st Annual Meeting, Atlanta, GA, **March 2006** (oral).

[27] Zhang, H., Kuiken, T., Dill, C., Ensor, M. Aquatic Photochemokinetic Rates of Production and Loss of Dissolved Gaseous Mercury (DGM) in a Southern Reservoir Lake of Tennessee. American Chemical Society 226th Annual Meeting. San Diego, CA, **March, 2005** (oral).

[26]Zhang, H., Kuiken, T., Dill, D., Crocker, C., Ensor, M. Environmental Chemistry and Transport of Mercury in the Upper Cumberland Region. Tennessee EPSCoR Environmental Summit, 2005, Cookeville, TN, **February, 2005** (poster).

[25] Zhang, H., Dill, C., Kuiken, T., Ensor, M., Crocker, C. Sunlight-induced seasonal changes of dissolved gaseous mercury (DGM) loading in a southern reservoir lake. The 56th Southeast Regional Meeting ACS, Research Triangle Park, NC, **November, 2004** (oral).

[24] Crocker, C., Kuiken, T., Zhang, H. Emission of aquatic gaseous mercury from a small, southern reservoir lake. The 56th Southeast Regional Meeting ACS, Research Triangle Park, NC, **November, 2004** (oral).
[23] Kuiken, T., Zhang, H., Lindberg, S., Crocker, C., Gustin, M. Natural mercury emissions from southeast background forest soils: An on-going study within the Standing Stone State Forest of Tennessee. The 56th Southeast Regional Meeting ACS, Research Triangle Park, NC, **November, 2004** (oral).

[22] Zhang, H., Dill, H., Kuiken, T., Ensor, M. Diurnal changes of dissolved gaseous mercury (DGM) levels in a southern reservoir lake: Cane Creek Lake, Cookeville, TN. Tennessee Academy of Science Annual Meeting, Columbia, TN, **November, 2004** (oral).

[21] Crocker, C., Zhang, H., Kuiken, T. Estimation of emission of dissolved gaseous mercury (DGM) in a southern reservoir lake using a two-thin film model. Tennessee Academy of Science Annual Meeting, Columbia, TN, **November, 2004** (oral).

[20] Zhang, H., Dill, C., Kuiken, T., Nriagu, J., Lindberg**,** S. Driving force for diel change of dissolved gaseous mercury levels in surface freshwaters. Tennessee Academy of Science Annual Meeting, Franklin, TN, **November, 2003** (oral).

[19] Kuiken, T., Zhang, H. Quicksilver: Lead's toxic and environmental twin. Tennessee Academy of Science Annual Meeting, Franklin, TN, **November, 2003** (oral).

[18] Zhang, H., Lindberg, S., Southworth, G., Kuiken, T. Sunlight mediated biogeochemodynamics of mercury in the Everglades aquatic ecosystem: A case study. American Geophysics Union 2003 Fall Meeting, San Francisco, CA, **December, 2003** (poster).

[17] Dill, C., Kuiken, T., Ensor, M., Zhang, H. Aquatic Photochemodynamics of Dissolved Gaseous Mercury in a Small, Southern Lake (Cookeville, TN). The 55th Southeast Regional Meeting ACS, Atlanta, GA, **November, 2003** (oral).

Pre-Appointment at TTU (1999 – 2002)

[16] Zhang, H., Wang, X., Marsik, F.J., Lehman, J., Xu, X.-H., Nriagu, J., Keeler, G., Lindberg, S.E. Photochemodynamics of aquatic mercury in Saginaw Bay of Lake Huron (Michigan, USA). American Chemical Society 223rd Annual Meeting. Orlando, FL, **April, 2002** (oral).

[15] Marsik, F., Keeler, G., Lindberg, S., Zhang, H. Air-surface exchange of elemental mercury over a mixed sawgrass-cattail stand within the Florida Everglades. American Chemical Society 223rd Annual Meeting. Orlando, FL, **April, 2002**.

[14] Zhang, H., Kuiken, T., Lindberg, S.E., Nriagu, J. Photoproduction of dissolved gaseous mercury (DGM) in Saginaw Bay of Lake Huron (Michigan, USA): A preliminary study. *6th International Conference on Mercury as a Global Pollutant*. Minamata, Japan, **October, 2001** (oral)

[13] Zhang, H., Lindberg, S.E., Gustin, M.S. Nature of diel trend of mercury emission from soil: Current understanding and hypotheses. American Chemical Society 222nd Annual Meeting. Chicago, **August, 2001** (oral).

[12] Zhang, H., Lindberg, S.E., Kuiken, T., Nriagu, J. Photochemical production of dissolved gaseous mercury in freshwater: The role of Fe(III). American Chemical Society 222nd Annual Meeting. Chicago, **August, 2001** (oral).

[11] Lindberg, S. E., Gustin, M., Zhang, H., Brooks, S. Mercury emission and re-emission from diffuse area sources: The dilemma of small emissions from large surfaces, the "inert" nature of elemental mercury vapor, and missing sinks in the global mercury cycle. *The EPA Workshop on Mercury in Mining*, San Francisco, **November, 2000**.

[10] Gustin, M., Coolbaugh, M., Engle, M., Fitzgerald, B., Nacht, D., Zehner, R., Sladek, C., Keislar, R., Rytuba, J., Lindberg, S., Zhang, H. Atmospheric mercury emissions from mine waste. *The EPA Workshop on Mercury in Mining*, San Francisco, **November, 2000**.

[9] Zhang, H., Lindberg, S, Vette, A., Barnett, M., Gustin, M., Kuiken, T. Dynamic flux chamber measurement of mercury emission fluxes over soils: Effect of sweep air flushing flow rate and verification of a two-resistance exchange interface simulation model. *Society of Environmental Toxicology and Chemistry 21st Annual Meeting*. Nashville, **November, 2000** (oral)

[8] Zhang, H., Lindberg, S. Sunlight and Fe(III)-induced photochemical reduction of Hg(II) in fresh waters. *11th International Conference on Heavy Metals in the Environment*. Ann Arbor, **August, 2000** (oral).

[7] Zhang, H., Lindberg, S. Diel cycle of mercury emission from soil in the dark at constant temperature at ORNL: A mystery to be solved. *11th International Conference on Heavy Metals in the Environment*. Ann Arbor, **August, 2000** (poster).

[6] Lindberg, S., Zhang, H., Southworth, G., Reinhart, D., McCreanor, P., Wallschlager, D., Price, J. Atmospheric Mercury Emissions Releases from Municipal Solid Waste Landfills. *11th International Conference on Heavy Metals in the Environment*. Ann Arbor, **August, 2000**.

[5] Marsik, F., Keeler, G., Malcolm, E., Dvonch, J., Barres, J., Lindberg, S., Zhang, H., Stevens, R., Landis, M. Air-surface exchange of mercury over a mixed saw grass and cattail stand within the Florida Everglades. *11th International Conference on Heavy Metals in the Environment*. Ann Arbor, **August, 2000**.

[4] Lindberg, S., Brooks, S., Meyers, T., Zhang, H., Chambers, L Is the arctic a missing sink for mercury? New measurements of mercury speciations and depletion events at point Barrow. *6th International Conference on Air-Surface Exchange of Gases and Particles*. Edinburgh, UK, **July, 2000**.

[3] Lindberg, S., Hanson, P., Stratton, W., Meyers, T., Kim, K., Carpi, A., Zhang, H., Brooks, S., Owens, J., Barnett, M., Dong, W. The role of mercury air/surface exchange processes in the global biogeochemical cycle: A brief summary of research by the ORNL Mercury Group. National Institute for Minamata Disease Forum' 99. Minamata, Japan, **October, 1999**.

[2] Zhang, H., Lindberg, S., Vette, A., Gustin, M. Mercury emissions from soils measured with dynamic flux chambers: new discoveries and unanswered questions. *5th International Conference on Mercury as a Global Pollutant*. Rio de Janeiro, Brazil, **May, 1999** (poster).

[1] Zhang, H. Some hypotheses on the soil moisture effect and preliminary tests. *Guelph Mercury Workshop*. Toronto, Canada, **May, 1998** (oral).

RESEARCH FUNDING

Total Funding (2002-2011): 194K

Zhang, H., Wells, M.J.M. Developing a website for environmental chemistry education. ACS Committee on Divisional Activities. **$5000**. **Jan 2010-Aug 2013**.

Zhang, H. Molecular photoredox chemistry of mercury in aquatic systems: kinetics, mechanism, and environmental implication. ORNL/US DOE, **$80,000**, **May 2008-Oct 2011**.

Zhang, H. Effect of iron-enhanced photochemical transformation of aquatic organic acids on fate of trace metals in southern reservoir lakes. TTU Faculty Research Initiation Program Award, **$4000**, **Sept 2005-Sept 2007**.

Zhang, H. Global biogeochemical cycling of trace metals: Transport, transportation, and fate of mercury in watershed, a need for an automated trace elemental mercury analyzer. USDA, **$40,000** ($20,000 TTU Match), **Sept 2003-Sept 2004**.

Zhang, H. Effect of sunlight on trace metal cycling in aquatic systems: A study on aquatic mercury photochemical cycling in subtropical lakes. Private funds, **$15,000**, **Oct 2002-Oct 2005**.

Gustin, M.S., Lindberg, S.E., Zehner, R.E., Zhang, H., Johnson, D.W., Schorran, D.E., Rytuba, J. Assessment of Natural Source (Geologic and Vegetation) Mercury Emissions: Speciation, Mechanisms, and Significance. US EPA STAR Grant, **$50,000** for TTU group, **Oct 2002-Dec 2006**.

Marsik, F., Keeler, G., Zhang, H., Andresen, J. The Air-Surface Exchange of Speciated Mercury over Agricultural Crops and Soils. Michigan Great Lakes Protection Fund, **2002**.

Nriagu, J.O., Lindberg, S.E., Keeler, G., Zhang, H., Lehman, J. Photoinduced Reduction of Mercury in Lakes, Wetlands and Soils. US EPA STAR Grant, **2000-2003**.

PROFESSIONAL MEMBERSHIP

American Chemical Society (Environmental Chemistry Division, 1999-Present).

TEACHING EXPERIENCE

EVSC7120 Water, Soil, Air Chemistry-II
EVSC7110 Water, Soil, Air Chemistry-I
EVSC6010 Environmental Chemistry

CHEM4720 Advanced Environmental Chemistry
CHEM5720 Advanced Environmental Chemistry
CHEM4720/5720 Advanced Environmental Chemistry Lab
CHEM4710/5710 Environmental Chemistry

CHEM3410 Quantitative Analysis
CHEM3410 Quantitative Analysis Lab
CHEM3420 Quantitative Analysis Lab

CHEM1110 General Chemistry
CHEM1020 General Chemistry
CHEM1020 General Chemistry Lab
CHEM1010 General Chemistry
CHEM1010 General Chemistry Lab

CHEM1211 General Chemistry Honor Recitation
CHEM1111 General Chemistry Honor Recitation

EVSC7970 Special Topic, Environmental Photochemistry
CHEM6970 Special Topic, Environmental Redox Chemistry
CHEM6970 Special Topic, Environmental Free Radical Chemistry and Photochemistry

STUDENTS SUPERVISED/TRAINED

Environmental Science Ph.D. Program

Lesta Kocher — ***Jan 2017-Dec 2022 (graduated)***
Dissertation: A passage to coupled redox cycling and water/air cycling of mercury (Hg): Aquatic Hg(II) reduction mediated by superoxide and Hg(0) water/air exchange coefficient for Cane Creek Lake (Cookeville, TN)

Stephen Okine	***Jan 2010 – Dec 2013 (graduated)*** ***Dissertation:*** Photochemical redox chemistry of aquatic mercury Photochemical reduction of divalent mercury (Hg(II)) in UVB light by humic acids and low molecular mass organic acids (oxalate, cysteine): A probe into mechanism and kinetics
Wasana Senevirathna	***Dec 2007 – Dec 2008*** (transferred to another program) ***Research:*** Desorption of Hg(II) from Kaolinite in the presence of oxalate and cysteine
Todd Kuiken	***June 2003 – Aug 2007 (graduated)*** ***Dissertation:*** Mercury air/surface exchange over terrestrial background surfaces of the eastern USA and its policy implications

ACS Chemistry M.S. Program

Lesta Kocher	***Jan 2015-Dec 2016 (graduated)*** ***Thesis:*** Estimation of the kinetics of photochemical reduction of aquatic mercury using a simple mass balance box model, 2016
Tao Liu	***June 2009 – Dec 2011(graduated)*** ***Thesis:*** Oxidation of aqueous elemental mercury through the Fenton reaction, 2011
Chad Crocker	***Oct 2003 – May 2005 (graduated)*** ***Thesis:*** Air/water exchange of aquatic gaseous mercury in a southern reservoir lake: Cane Creek Lake, Putnam County, TN, 2005
Chris Dill	***Jan 2003 – May 2004 (graduated)*** ***Thesis:*** Aquatic photochemokinetics of mercury in Cane Creek Lake, Putman County, TN, 2004

Undergraduate Research

Zoe Penn	Fall 2021-Spring 2022
Zach Rush	Fall 2021-Spring 2022
Jordan Ragon	Fall 2013-Dec 2013
Mariatou Sisay	Jan 2013-Dec 2013
Sarah Gray	Sept 2012-May 2013
Josh Escue	Sept 2011-Feb 2012
Logan Bush-Mahoney	Sept 2011-Dec 2011
Claire Robinson	Sept 2011-August 2012
Zach Andreasen	Jan 2010-May 2013
Allison Williams	Sept 2010-Dec 2010
Carrie Thomson	Jan 2010-May 2011
Carson Prevatte	Sept 2008-May 2011
Yuanjing Guo	Jan 2010-Sept 2010

Amy Sims	Sept 2006-May 2009
Jamie Potter	Feb 2009-May 2009
Brandi Roberson	Jan 2009-May 2009
Sandra Miselem	Sept 2008-June 2009
Sarah Reynolds	Sept 2007-May 2008
Bethany Growden	Sept 2007-Decr 2008
Matt Stone	Oct 2006-May 2007
Drew Jones	Sept 2006-May 2007
Stephanie Holbrook	Sept 2005-May 2007
Natalie Stewart	Sept 2003-May 2005
Benjamin Taylor	Jan – May 2005
Charles Swor	May 2003-Decr 2004
Shannon McCawley	May 2003-Decr 2003
Melissa Ensor	May 2003-Aug 2003
Elijah Hixson	Sept – Dec 2003
David Ball	Sept 2002-May 2003
Charli Beauchamp	Dec 2002-May 2004

GRAUDATE STUDENT RESEARCH COMMITTEE SERVED

Environmental Science Ph.D. Program

Chioma Ekechi	Jan 2018-Jan 2020
Lahiru Gamage	Sept 2015-August 2019
Uttam Sharma	April 2013-Dec 2018
Sunil Rawal	March 2013-Dec 2015
Brain Agee	Feb 2012-Dec 2016
Chinyere Mbachu	Feb 2012-Dec 2012
Upul Deepthike	graduated, Aug 2010
Alisha Pendergrass	graduated, May 2010
Tammy Boles	graduated, Dec 2009
Todd Kuiken	graduated, Aug 2007
Zhonghua Li	graduated, Aug 2007
Tim Cofer	graduated, May 2005
Le-Ellen Huff	graduated, May 2004
Wasana Senevirathna	Dec 2007-Dec 2008
Mark Gabriel	Dept of Civil and Environmental Engineering U of Alabama at Tuscaloosa (graduated, May 2005)

ACS M.S. Program

Bryant Davis	Fall 2019-Fall 2022
Shengxi Jin	Feb 2013-Dec 2015
Amanda Nguy	May 2012-Dec 2012
Jordan Duan	Fall 2009-Aug 2011(graduated)
Freddy York	Fall 2008-Fall 2009
John Partridge	Spring 2008-Dec 2010 (graduated)
Melissa Easterly	Dec 2006 (graduated)
Ben Harmon	Dec 2005 (graduated)

COMMIDTTEE SERVICE

Environmental Science Ph.D. Program:
EVSC Ph.D. Program Chemistry Academic Advisor, **Aug 2013-Present**
EVS Ph.D. Program Scholarship Committee, **March 2013-Present**

Chemistry Department:
Chair, Analytical Chemistry Faculty Search Committee, **Aug 2021-June 2023**
Scholarship Committee, **March 2013-Jan 2014**
Environmental Oversee Committee, **Spring 2013-Present**
Biology Department Aquatic Biology Faculty Search Committee, **Spring 2012**
Biology Department Instructor Search Committee, **Spring 2012**
Chemistry Department Executive Committee, **Jan 2012-Present**
Chemistry Department Graduate Committee, **Spring 2003-Jan 2014**

College of Arts & Sciences representative alternate for the TTU Caplenor Faculty Research Award Committee, **Spring 2009-Spring 2012**
Analytical Faculty Search Committee, **Fall 2003**
Chemistry Department Environmental Committee, **2002-2008**

(*Updated August 2023*)