

Mae Sexauer Gustin

Professor

Department of Environmental and Resource Sciences MS 370

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Education

- 1988 University of Arizona, Tucson
Ph.D. Geosciences – Geochemistry Economic Geology
- 1983 University of North Carolina, Chapel Hill
M.S. Geosciences - Igneous and Metamorphic Petrology
- 1979 Guilford College, Greensboro, NC
B.S. Geology major, Math minor

Professional Experience

- July 2009 Professor and UNR Foundation Professor, University of Nevada
- July 2003 Associate Professor, University of Nevada, Reno
- July 1999 Assistant Professor, University of Nevada, Reno
- 1994- 1999 Assistant Research Professor, University of Nevada, Reno
- 1993-1994 Research Associate, Desert Research Institute, Reno, NV
Assistant Professor, Sierra Nevada College, Incline Village, NV
- 1991-1993 Adjunct Professor, Sierra Nevada College, Incline Village, NV
Adjunct Professor, Truckee Meadows Community College, Reno, NV
- 1987-1989 Assistant Professor of Geology, Indiana University-Purdue University at Indianapolis, IN
- 1982-1987 Teaching Assistant and Head Teaching Assistant, The University of Arizona, Tucson, AZ
- 1979-1982 Teaching Assistant, The University of North Carolina at Chapel Hill

Professional Interests

My primary research interests are the study of the fate and transport and biogeochemical cycles of inorganic contaminants in the environment. My recent work focuses primarily on understanding the chemistry and environmental fate of atmospheric mercury in the environment, and the sources of ozone and other air pollutants to the western United States. I am especially interested in regional and long range transport, and how air pollution moves in complex terrains. Specific research topics in the past included investigation of natural sources of atmospheric mercury, the role of plants in the biogeochemical cycling of mercury, mercury pollution and methyl mercury production in watersheds impacted by legacy mining, and arsenic. I also have done a significant amount of work investigating the potential use of coal combustion by-products as agricultural amendments; and on Hg release from areas of legacy and industrial scale mining. I have worked with the mining industry to develop best-management practices for reducing Hg releases from non-point sources. I have also done research on the fate of trifluoroacetic acids and organophosphate pesticides during interaction with vegetation and soils. I am especially

interested in the role that the atmosphere, and vegetation, play as sources, sinks and pathways for cycling of environmental contaminants.

Awards and Honors

Researcher of the Year (2015) College of Agriculture Biotechnology and Natural Resources, University of Nevada-Reno

Excellent Reviewer Award for Environmental Science and Technology 2013

Nevada Women's Fund Women of Achievement Award UNR 2010

University of Nevada Cooperative Extension UNR Faculty Award of Excellence 2009

University of Nevada Foundation Professor University of Nevada (2009)

Researcher of the Year (2001) College of Agriculture Biotechnology and Natural Resources, University of Nevada-Reno

Professional organizations:

Geological Society of America (33yrs), Geological Society of Nevada (15 yrs),

American Chemical Society (20 yrs), Association for Women Geoscientists (24 years),

Geochemical Society (9 yrs), Air and Waste Management Association (10years),

American Geophysical Union (20 yrs)

Member Phi Beta Kappa (since 1979)

Regional, National and International committee work

Regional

- Chair project review team for Cal-Fed project Development of best management practices to reduce methyl mercury exports and concentrations from seasonal wetlands in the Yolo Wildlife Area 2010-2013
- Hosted and helped organize Western States Air Resources Council (WESTAR) workshop on Western Ozone Transport October 10-12, 2012
- EPA Region IX-Carson River Superfund Site Scientific Advisory Board 2000
- Committee for development of protocol for fish consumption advisories for mercury, State of Nevada, Nevada State Health Division
- Fish and Wildlife Service-Stillwater National Wildlife Refuge Scientific Advisory Board 2000

National

- Organized WESTAR Ozone conference 2012
- National Atmospheric Deposition Network Scientific Advisory Board (2010- present)
- Western North America Mercury Synthesis Group-participant (2012-present)
- National Mercury Deposition Network Total Deposition Science Committee 2011-
- National EPA Mercury Monitoring Network Workshop Participant-2008
- Review team for NOAA Atmospheric Research Laboratory 2011
- Organized NSF funded workshop on Uncertainties in Measurement of Atmospheric Mercury 2008
- National Mercury Monitoring Network Workshop Participant – 2007
- Working group North American Implementation Task Force on Mercury 2001

International

- International Mercury Dry Deposition Workshop-U Mich participant Aug 2008
- National Academy of Science Committee Member (2008-2010)-Report on International Transport of Air Pollutants
- Special issue journal editor for Applied Geochemistry volume for 8th International Conference on Mercury as a Global Pollutant
- Technical Advisor for 6th (2001) and 7th (2004) International Conferences on Mercury as a Global Pollutant
- Session organizer for 8th (2008) and 10th (2011) International Conference on Mercury as a Global Pollutant
- Technical Advisor for World of Coal Ash meeting 2007
- Session organizer for fall meeting AGU 2008, 2014

Professional Service

- Associate Editor *Science of the Total Environment* (2012- present)
- Editorial Board *Science of the Total Environment* (2003-2011)
- U. S. Dept of Agriculture National Research Initiative Review Panel 2004
- National Science Foundation Proposal Review Panel member 2009, 2010, 2012
- EPA Graduate Fellowship Review panel 2007
- Regular reviewer for Environmental Science and Technology, Applied Geochemistry, Biogeochemistry, Science of the Total Environment, Chemosphere, Environmental Pollution, Atmospheric Environment, Journal of Geophysical Research, Atmosphere

Teaching Activities

Regular course responsibilities while at University of Nevada: New undergraduate class Environmental Ethics, NRES 210 Environmental Pollution (sophomore level), NRES 467/667 Regional and Global Issues in Environmental Science (senior capstone), NRES 765 Biogeochemical cycles (graduate student class), and NRES 720 Survivor Skills for Graduate Students (graduate student class)

Students and Post-doctoral Scholars Advised

Graduate Advisor

MS: Jennifer Arnold, Christian Briggs, Raj Chavan, Jody Ericksen, Mark Demuth, Laura Fay, Toby Frescholtz, Tony Giglini, Keith Heidecorn, Melissa Markee, Matthieu Miller, David Nacht, Claudia Pizarro-Barrara, Allison Millhollen, Angela Paul, Matthew Peckham, Christianna Peterson, Beth Thomas, Genine Wright

PhD: Mark Engle, Rebekka Fine, Seth Lyman, Matthieu Miller, Ashley Pierce, Jelena Stamenkovic (Hartman), Mei Xin

Other major graduate students - Mitch Blum, Scott Brown, Peter Fischer, Todd Leonard, Adam Jew, Todd Kuiken, Jennifer Quashnik, Scott Reineman

Post Doctoral Researchers - Christopher Eckley, Jioayan Huang, Daniel Obrist, Ann Rhea, Allan Vette

Peer-reviewed Publications (~140 total, Underlined names are graduate or undergraduate students; NAES number is Nevada Agriculture Experiment Station reference)

Gustin, M. Sexauer, Peterson, C., Fine, R., Donaldson, S. , Lyman T. , Alishahi, M., Miller, M.B. Investigation of methylmercury in irrigation drains and impacts on receiving waters, Nevada, USA, submitted to Journal of Nevada Water Resources, July 10, 2015.

Huang, J., Gustin, M. S. 2015 Use of Criteria Pollutants, Active and Passive Mercury Sampling, and Receptor Modeling to Understand the Chemical Forms of Mercury in Florida, .Atmospheric Chemistry and Physics Discussions, 15,12069-12015. Doi:10.5194/acpd-1512069-2015.

Huang, J. and Gustin, M.S. 2015 Effect of relative humidity on KCl denuders and membranes used to collect gaseous oxidized mercury, Environmental Science and Technology 49: 6102-6108. DOI: 10.1021/acs.est.5b00098.

Gustin, M. S. , Amos, H. A, Huang, J., Miller, M.B., Heidecorn. 2015 Measuring and modeling mercury in the atmosphere: A critical review, Invited paper- Special Issue of Atmospheric Chemistry and Physics. Atmospheric Physics and Chemistry, 15: 5697-2015. doi: 10.5194/acp-15-5697-2015.

Gustin, M. S. , Amos, H. A, Huang, J., Miller, M.B., Heidecorn. 2015 Successes and challenges of measuring and modeling atmospheric mercury at the part per quadrillion level, Invited paper- Special Issue of Atmospheric Chemistry and Physics. Atmospheric Physics and Chemistry Discussions, 15: 1-45.

Miller, M.B., Gustin, M.S. 2015 Gas-exchange chamber analysis of elemental mercury deposition/emission, Chemosphere, 131: 209-216.

Fine, R., Miller, M.B., Gustin, M.S. Development of a statistical model to identify spatial and meteorological drivers of elevated O₃ in rural Nevada and its application to other rural mountainous regions, Science of the Total Environment,530-531: 526-533 doi: 10.1016/j.scitotenv.2015.03.148.

Miller M.B., Gustin M.S., Fine R., Pierce A. Tracking sources of ozone to three rural locations in Nevada, USA, using ancillary pollutants and mercury. Science of the Total Environment, 530-531: 483-492 doi: 10.1016/j.scitotenv.2015.03.346.

VanCuren R , Gustin M.S. Identification of sources contributing to PM_{2.5} and ozone at Great Basin National Park, Nevada, US Science of the Total Environment 530-531: 505-518 doi:10.1016/j.scitotenv.2015.03.091

Christensen, J.N., Weiss-Penzias, P., Fine, R., McDade C.E., Trzepla K, Brown, S.T. , Gustin, M. S. Unraveling the Sources of Ground Level Ozone in the Intermountain Western United States, Science of the Total Environment 530-531: 519-525 doi: 10.1016/j.scitotenv.2015.04.054

- Fine R., Miller M.B., Yates E.L., Gustin M.S. Investigating the influence of long-range transport on surface O₃ in Nevada, USA using observations from multiple measurement platforms. *Science of the Total Environment* 530-531: 493-504 doi: 10.1016/j.scitotenv.2015.03.125.
- Reinemann S.A., Porinchu D.F., Gustin M.S., Greenwood B. 2014 Historical trends of mercury and spheroidal carbonaceous particle deposition in subalpine lakes in the Great Basin, United States. *Journal of Paleolimnology*, 52(4): 405-418 DOI 10.1007/s10933-014-9801-7
- Weiss-Penzias P.S., Amos H.M., Selin N.E., Gustin M.S., Jaffe D.A., Obrist D., Sheu G.-R., Giang A. 2015 Use of a global model to understand speciated atmospheric mercury observations at five high-elevation sites. *Atmospheric Chemistry and Physics* 15, 1161-1173.
- Huang J., Gustin M.S. 2015 Use of passive sampling methods and models to understand sources of mercury deposition to high elevation sites in the Western United States. *Environmental Science and Technology*, 49 (432-441) DOI 10.1021/es502836w
- Fine R., Miller M.B., Burley J., Jaffe D.A., Pierce R.B., Gustin M.S. MDA8 O₃ values at rural surface sites in Nevada, USA: Results from two years of the Nevada Rural Ozone Initiative (NVROI) 2015. *Science of the Total Environment* 530-531: 455-470
DOI: <http://dx.doi.org/10.1016/j.scitotenv.2014.12.027>)
- Gustin M.S., Fine R., Miller M.B., Jaffe D.A., Burley J. The Nevada Rural Ozone Initiative (NVROI): Insights to Understanding Air Pollution in Complex Terrain 2015. *Science of the Total Environment* 530-531: 453-454 doi:10.1016/j.scitotenv.2015.03.046.
- Peacock M.M., Gustin M.S., Kirchoff V., Robinson M.L., Pizarro-Barraza C., and Loux T. 2015 Native non-game fishes in the Truckee River: Are barriers and patterns of population genetic structure related? Submitted to *Plos One* Feb 23, 2015.
- Jaffe D.A., Lyman S.N., Amos H.M., Gustin M.S., Huang J., Selin N.E., Levin L., ter Schure A., Mason R.P., Talbot R., Rutter A, Finley B., Jaeglé L., Shah V., McClure C., Ambrose J., Gratz L., Lindberg S., Weiss-Penzias P., Sheu G.-R., Feddersen D., Horvat M., Dastoor A., Hynes A.J., Mao H., Sonke J.E., Slemr F., Fisher J.A., Ebinghaus R., Zhang Y., Edwards G. 2014 Viewpoint: Progress on understanding atmospheric mercury hampered by uncertain measurements. *Envir. Sci Tech.* 48; 7204-7206
- Wright, G., Woodward, C., Peri, L., Weisberg, P., Gustin, M. S. 2014 Application of tree rings [dendrochemistry] for detecting historical trends in air Hg concentrations across multiple scales *Biogeochemistry* 120:149-12
- Pizarro-Barraza C., Gustin M.S., Peacock M., Miller M.B. 2014 Evidence for sites of methylmercury formation in a flowing water system: Impact of anthropogenic barriers and water management *Science of the Total Environment* 478C (2014), pp. 58-69
- Huang J., Lyman S.N., Stamenkovic Hartman J., Gustin M.S., 2014, A review of Passive sampling systems for ambient air mercury measurements Invited paper for Special Issue on Research and Technology Development at the Leading Edge of the Field of Passive Sampling, Editors Professors Philipp Mayer, Frank Wania and Charles S. Wong *Environmental Science: Processes & Impacts* (Formerly the Journal of Environmental Monitoring) *Environ. Sci.: Processes Impacts*, 16, 374-392.

- Wright, G., Miller, M.B., Weiss-Penzias P, Gustin, M Investigation of mercury deposition and potential sources at six sites from the Pacific Coast to the Great Basin, USA, Science of the Total Environment 470-471C (2014), pp. 1099-1113
- Huang J., Miller M.B., Weiss-Penzias P., Gustin M.S. 2013 Comparison of Reactive Mercury Measurements Made with KCl-coated Denuders, Nylon Membranes, and Cation Exchange Membranes Environmental Science and Technology, 47: 7307-7316.
- Briggs, C. Gustin, M.S. 2013 Building upon the conceptual model for soil mercury flux: Evidence of a link between moisture evaporation and Hg evasion, Water Air Soil Pollution September 2013, 224:1744
- Finley B.D., Jaffe, D.A., Call K., Lyman, S.L, Gustin, M.S., Lyman, T. 2013 Development, testing, and deployment of an air sampling manifold for spiking elemental and oxidized mercury during RAMIX Environmental Science and Technology, 47: 7277-7284.
- Ambrose J.L., Lyman S.N., Huang J., Gustin M.S., and Jaffe D.A. 2013 Fast Time Resolution Oxidized Mercury Measurements during the Reno Atmospheric Mercury Intercomparison Experiment (RAMIX) Environmental Science and Technology, 47: 7285-7294.
- Gustin M.S., Huang J., Miller M.B., Peterson C., Jaffe D.A., Ambrose J., Finley B.D., Lyman S.N., Call K., Talbot R., Feddersen D., Mao H., Lindberg S.E. 2013 Do We Understand What the Mercury Speciation Instruments Are Actually Measuring? Results of RAMIX Environmental Science and Technology 47: 7295-7306
- Miller M.B., Gustin M.S., 2013 Testing and modeling the influence of reclamation and control methods for reducing non-point mercury emissions associated with industrial open pit gold mines Journal of the Air and Waste Management Association, DOI:10.1080/10962247.2013.778221
- Briggs C, Fine R, Markee M., Gustin M.S., 2013 Investigation of the Potential for Mercury Release from Flue Gas Desulfurization Solids Applied as an Agricultural Amendment in Special Section: Sustainable Use of FGD Gypsum in Agricultural Systems, Journal of Environmental Quality 43(1): 253-262 doi:10.2134/jeq2012.0049
- Gustin MS, Weiss-Penzias PS, Peterson C. 2012 Investigating sources of gaseous oxidized mercury in dry deposition at three sites across Florida, USA. Atmospheric Chemistry and Physics; 12: 9201-9219.
- Huang JY, Gustin MS. 2012 Evidence for a Free Troposphere Source of Mercury in Wet Deposition in the Western United States. Environmental Science & Technology 2012; 46: 6621-6629.
- Peterson C, Alishahi M, Gustin MS. 2012 Testing the use of passive sampling systems for understanding air mercury concentrations and dry deposition across Florida, USA. Science of the Total Environment 2012; 424: 297-307.
- Amos, H., Jacob.,D. Holmes, C., Fisher, J.A., Wang, Q, Yantosca, R.M., Corbitt, E.S. Galarneau, E., Rutter, A.P, Gustin, M.S., Steffen, A., Schauer, J., Graydon, J., St. Louis, V., Talbot, R., Edgerton, E., Sunderland., E. 2012 Gas Particle Partitioning of Atmospheric (II) and its effect on global mercury deposition - Atmospheric Chemistry and Physics 12, 591-603.

- Miller, M., Gustin, M.S. and Eckley, C. 2011 Measurement and Scaling of air-surface exchange from substrates in the vicinity of two Nevada gold mines, *Science of the Total Environment*, 409: 3879-3866.
- Gustin, M.S., Lyman, S.N., Kilner, P., Prestbo, E. 2011 Development of a passive sampler for total gaseous mercury, *Atmospheric Environment*, 45, 5805-5812.
- Eckley CS, Gustin M, Miller MB, Marsik F. 2011 Measurement of surface mercury fluxes at active industrial gold mines in Nevada (USA) *The Science of the Total Environment* 409 514-522
- Eckley CS, Gustin M, Miller MB, Marsik F. 2011 Scaling of nonpoint source Hg emissions from active industrial gold mines-influential variables and annual emission estimates. *Environmental Science and Technology* 45(2), 392-399
- Gustin, M. S. 2011 Exchange of Mercury between the Atmosphere and Terrestrial Ecosystems, Chapter 13 in *Environmental Chemistry and Toxicology of Mercury* Liu, G., Cai, Y., O'driscoll, N eds John Wiley and Sons.
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- Weiss-Penzias, P., Gustin, M., Lyman, S. 2011 Sources of gaseous oxidized mercury and impacts on dry deposition at two southeastern U.S. sites *Atmospheric Environment* 45 4569-4579
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- Lyman SN, Jaffe DA, Gustin MS. Release of mercury halides from KCl denuders in the presence of ozone. *Atmos. Chem. Phys.* 2010; 10: 8197-8204.
- Gustin M, Ladwig K. 2010 Laboratory Investigation of Hg Release from Flue Gas Desulfurization Products. *Environmental Science & Technology* 44: 4012-4018.
- Gustin, M. S.; Jaffe, D. 2010 Reducing the uncertainty in measurement and understanding of mercury in the atmosphere *Environmental Science and Technology* 44: 2222-2227.
- Eckley, C.S., Gustin, M., Lin, C.-J., Li, X., Miller, M.B. 2010 The influence of dynamic chamber design and operating parameters on calculated surface-to-air mercury fluxes *Atmospheric Environment* 44:194-203
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- Lyman, S., Gustin, M. Prestbo, E. 2010 Development and use of passive samplers for determining reactive gaseous mercury concentrations, *Atmospheric Environment* 44: 246-252
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- Stamenkovic, J and Gustin, M.S. 2009 Non-stomatal versus stomatal foliar mercury exchange, *Environmental Science and Technology*, 43: 1367-1372.
- Peterson, C., Gustin, M.S. 2008 Mercury in air, water and biota at the Great Salt Lake, *Science of the Total Environment*, 405: 255-268.
- Gustin, M.S., Ericksen J.A., Fernandez, G.C. 2008 Determination of the potential for release of mercury from combustion product amended soils –I. Simulations of beneficial use, *Journal of Air and Waste Management Association*, 58: 673-683.
- Gustin, M.S., Xin, M. Ericksen J.A., Fernandez, G.C 2008 Determination of the potential for release of mercury from combustion product amended soils –II. Coal fly ash generated stabilized soil and degradation products, *Journal of Air and Waste Management Association* 58: 1495-1508.
- Gustin M, Lindberg S., Weisberg P. 2008 An update on our understand of the role of natural sources and sinks in the biogeochemical cycle of Hg, *Applied Geochemistry* 23: 482-493.
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- Xin, Mei, Gustin, Mae, Johnson, DW 2007 Assessing mercury emission and re-emission from soils with spiked HgCl₂ solution and UV light exposure, and isotherm behavior Environmental Science and Technology 41: 4946-4951 (NAES 52077049)
- Xin, Mei, Gustin, M.S. 2007 Gaseous elemental Hg exchange with low Hg containing soils: Investigation of controlling factors Applied Geochemistry 22: 1451-1466 (NAES 52055542)
- Gustin, MS Lindberg SE Weisberg P 2007 An update on our understanding of the role of natural sources and sinks in the biogeochemical cycle of mercury EPRI report 1012572 Mercury in the Environment A research review. Chapter 2.
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- Stamenkovic, J., Gustin, M.S. 2007 Evaluation of EcoCELL technology for quantifying total gaseous mercury fluxes over background substrates, Atmospheric Environment 41:702-3712 (NAES 52066966)
- Fay, L., Gustin, M. 2007 Investigation of mercury accumulation in cattails growing in constructed wetland mesocosms Wetlands 27, 1056-1065. (NAES 52066966)
- Fay, L., Gustin, M. 2007 Assessing the influence of different atmospheric and soil mercury concentrations on foliage in a controlled environment, Water Air Soil Pollution 181: 373-384 (NAES 52066968)
- Brown, S., Saito, L., Knightes, C., Gustin, M. 2007 Calibration and evaluation of a mercury model for a western stream and constructed wetland Water Air Soil Pollution 181: 275-290.
- Gustin, M.S., Engle, M.A., Ericksen, J., Lyman, S., Stamenkovic, J., Xin, M. 2006 Mercury exchange between the atmosphere and low Hg containing substrates, Applied Geochemistry, 21(11) 1913-1923. (NAES 52066972)
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Presentations

2015

Humidity Influences on Measurement of Atmospheric Oxidized Mercury Measurements Using Membranes and KCl-coated Denuders, Jiaoyan Huang, Keith Heidcorn, Mae Sexauer Gustin **International Conference on Mercury as a Global Pollutant, Jeju, South Korea, June 14-19, 2015**

Use of passive sampling methods and models to understand gaseous oxidized mercury at high elevation sites in the Western United States, Jiaoyan Huang^{a,*}, Mae Sexauer Gustin^a **International Conference on Mercury as a Global Pollutant, Jeju, South Korea, June 14-19, 2015**

Estimation of mercury dry deposition in the Western United States: Results from Community Multi-scale Air Quality (CMAQ) model and surrogate surface measurements, Jiaoyan Huang¹, Heather Holmes², Mae Sexauer Gustin¹
June 14-19, 2015 **International Conference on Mercury as a Global Pollutant, Jeju, South Korea, June 14-19, 2015**

2014

Jiaoyan Huang, Mae Sexauer Gustin Use of passive sampling methods to understand sources of mercury and other pollutants to high elevation sites in the Western United States, Poster Fall Meeting American Geophysical Union.

A.O. Langford, C.J. Senff,, R.J. Alvarez II, J. Brioude, O. R. Cooper, J.S. Holloway, M.-Y. Lin, R. D. Marchbanks, R. B. Pierce, P. J. Reddy, S.P. Sandberg, A.M. Weickmann, E.J. Williams, Mae Gustin, Thierry LeBlanc, Emma Yates Stratospheric contribution to surface ozone in the desert Southwest during the 2013 Las Vegas Ozone Study; Invited presentation American Geophysical Union.

Keith Heidcorn, Jiaoyan Huang, Mae Sexauer Gustin Comparison of the chemical composition of gaseous oxidized Hg in the atmosphere at 3 different locations in Nevada Poster Fall Meeting American Geophysical Union.

Rebekka Fine, Matthieu B. Miller, Joel Burley, Daniel A. Jaffe, R. Bradley Pierce, Meiyun Lin, Mae Sexauer Gustin1MDA8 O3 values at rural surface sites in Nevada, USA: Results from two years of the Nevada Rural Ozone Initiative (NVROI) Poster Fall Meeting American Geophysical Union.

Rebekka Fine, Matthieu B. Miller, Mae Sexauer Gustin Development of a statistical model to identify spatial and meteorological drivers of elevated O₃ in rural Nevada and its application to other rural, mountainous regions Oral presentation American Geophysical Union

Ashley Pierce, Mae Gustin, Jiaoyan Huang, Keith Heidecorn Comparison of mercury measurement methods using two active filter measurement methods and a Tekran speciation unit. Poster Fall Meeting American Geophysical Union.

Mae S. Gustin, Jiaoyan Huang, Seth Lyman, Dan Jaffe Uncertainties of gaseous oxidized mercury measurements: How to move forward? Invited Presentation Fall Meeting American Geophysical Union.

Jiaoyan Huang, Seth Lyman, and Mae S. Gustin Uncertainties of gaseous oxidized mercury measurements: Ambient air concentration and dry deposition Poster National Atmospheric Deposition Program Fall Meeting.

E.L. Yates, L.T. Iraci¹, R.B. Pierce, M. Gustin, R. Fine, M. Roby, D. Austerberry, T. Tanaka, W. Gore The Alpha Jet Atmospheric eXperiment (AJAX): Three years of airborne ozone and greenhouse gas measurements over California and Nevada 2014 NOAA ESRL GLOBAL MONITORING ANNUAL CONFERENCE May 2014

Mae Sexauer Gustin, Jiaoyan Huang Overview of Atmospheric Mercury Measurement Uncertainties Atmospheric Mercury Workshop, San Francisco.

Jiaoyan Huang, Mae Sexauer Gustin Use of passive sampling methods to understand sources of mercury and other pollutants to high elevation sites in the Western United States, Atmospheric Mercury Workshop, San Francisco,

2013

Morris, K., Wright, G., Gustin, M. S., Mast, A., Schmeltz, D., Gay, D., Steffan, A., Zhang, L., Blancard, P., Weiss-Penzias, P., Jaffe, D., Webster, J., 11th International Conference on Mercury as a Global Pollutant, "Spatial and temporal patterns of wet and dry deposition of mercury in Western North America".

Gustin, M. S. (Author Only), Fine, R. (Presenter & Author), Miller, M. (Author Only), Peterson, C. (Author Only), Burley, J. (Author Only), Jaffe, D. (Author Only), American Geophysical Union, Academic, Conference, "Investigating ozone in rural Nevada, USA: Results from the first year of the Nevada Rural Ozone Initiative (NVROI)".

Gustin, M. S. (Author Only), Fine, R. (Presenter & Author), Miller, M. (Author Only), Yates, E. (Author Only), Roby, M. (Author Only), Huang, J. (Author Only), Burley, J. (Author Only), Kuse, A. (Author Only), Ohyama, H. (Author Only), Gustin, M. S. (Author Only), American

Geophysical Union, Academic, Conference, "Investigation the utility of multiple measurement platforms to understand surface ozone in rural Nevada, USA".

Huang, J., Miller, M., Gustin, M. S., American Geophysical Union, Academic, Conference, "Measurement of gaseous oxidized mercury at a SEARCH newtork site in Florida, USA".

Weiss-Penzias, P. (Presenter & Author), Gustin, M. S. (Author Only), et al. (Author Only), American Geophysical Union, Academic, Conference, "Spatial and temporal trends of speciated air mercury concentrations in Western North America".

Briggs, C. (Author Only), Gustin, M. S. (Author Only), Ladwig, K. (Presenter & Author), Crop Science Society/Soil Science Society of America/American Society of Agronomy, Academic, Conference, "Investigation of Hg release from agricultural based soils amended with flue gas desulfurization soilids", **Invited**

Gustin, M. S., Jaffe, D., Huang, J., Weiss-Penzias, P., Peterson, C., Ambrose, J., 11th International Conference on Mercury as a Global Pollutant, Academic, Conference, "Addressing measurement uncertainties for gaseous oxidized mercury".

Eagle-Smith, C. (Presenter & Author), Gustin, M. S., et al., 11th International Conference on Mercury as a Global Pollutant, Academic, Conference, "Mercury cycling, bioaccumulation, and risk across Western North America: a landscape scale synthesis".

Christensen, J. (Presenter & Author), Weiss-Penzias, P., Brown, S., McDade, C., Jaffe, D., Gustin, M. S., International Goldschmidt Conference, Florence, Italy, Academic, Conference, "Unraveling sources of ground level ozone in the intermountain western U. S. through Pb isotopes".

2012

Huang, J. (Presenter & Author), Gustin, M. S. (Author Only), Miller, M. (Author Only), Weiss-Penzias, P. (Author Only), American Geophysical Union, Academic, Conference, "Comparison of Reactive Mercury Concentrations Measured Simultaneously Using KCl-coated Denuders, Nylon Membranes, and Cation Exchange Membranes".

Gustin, M. S., American Geophysical Union, Academic, Conference, "Sources of Mercury Measured in Wet and Dry Deposition in the Western United States", **Invited**.

Wright, G. (Presenter & Author), Gustin, M. S. (Author Only), Weiss-Penzias, P. (Author Only), American Geophysical Union, Academic, Conference, "Use of passive samplers and surrogate surfaces to investigate sources of mercury deposited to the western United States".

Fine, R. (Presenter & Author), Gustin, M. S. (Author Only), WESTAR (Western States Air Resources Council)-Conference on Western Ozone Transport, Non-Academic, Workshop, "Rural ozone transport in Nevada", WESTAR and University of Nevada-Reno.

Gustin, M. S., Huang, J., Miller, M., Peterson, C., Jaffe, D., Ambrose, J., Finley, B., Lyman, S., Call, K., Hynes, A., Bauer, D., Everhart, S., Remeika, J., Talbot, R., Fedderson, D., Mao, H., Obrist, D., Pierce, A., Lindberg, S., National Atmospheric Deposition Network Annual Meeting, Non-Academic, Conference, "Overview of the Results of the Reno Atmospheric Mercury eXperiment (RAMIX)".

Gustin, M. S., Peterson, C., Weiss-Penzias, P., National Atmospheric Deposition Network Annual Meeting, Non-Academic, Conference, "Use of passive samplers and surrogate

surfaces for measurement of atmospheric Hg at three sites in Florida".

Gustin, M. S., EPRI-Southern CO workshop on mercury research SE US, Non-Academic, Workshop, "Passive sampler and surrogate surface measurements at Florida TMDL sites to assess mercury dry deposition and atmospheric concentrations", EPRI.

Gustin, M. S., Total Deposition Science Committee Meeting, Non-Academic, Roundtable, "Progress on Investigating the Use of Surrogate Surfaces and Passive Samplers for Measuring Atmospheric Mercury", Invited, National Atmospheric Deposition Network.

2011

Gustin, M. S. (Author Only), Weiss-Penzias, P. (Presenter & Author), Fine, R. (Author Only), Jaffe, D. (Author Only), Gao, W. (Author Only), American Geophysical Union, Academic, "Back trajectory analyses of high ozone days for a 15 year record of measurements at Great Basin National Park".

Fine, R. (Presenter & Author), Gustin, M. S., Peterson, C. (Author Only), Weiss-Penzias, P. (Author Only), Jaffe, D. (Author Only), American Geophysical Union, Academic, "The Nevada Rural Ozone Initiative: Field measurements of surface ozone in rural settings".

Gustin, M. S. (Presenter & Author), Briggs, C. (Author Only), Fine, R. (Author Only), World of Coal Ash, Non-Academic, "Mercury Release from Soils Amended with Flue Gas Desulfurization Solids", **Invited**.

Gustin, M. S., Local Chapter of American Chemical Society, Academic, "Atmospheric Mercury: Why Nevada Matters", **Invited**.

Gustin, M. S. (Presenter & Author), Miller, M. (Presenter & Author), Huang, J. (Presenter & Author), Nevada Mining Association and Nevada Division of Environmental Protection Meeting, Non-Academic, "Update on work investigating fugitive mercury emissions from Nevada gold mines", **Invited**.

Gustin, M. S., National Atmospheric Deposition Network Annual Meeting, Non-Academic, "Surrogate surfaces and passive samplers for measuring GOM dry deposition and GOM concentrations", National Atmospheric Deposition Program. **Invited**.

Gustin, M. S. (Presenter & Author), Pizzarro-Barrara, C. (Author Only), Peacock, M. M. (Author Only), Nevada Water Resources Association Truckee River Conference, Non-Academic, "Mercury in Abiotic and Biotic Components of the Truckee River".

Peterson, C. (Presenter & Author), Gustin, M. S. (Author Only), International Conference on Mercury as a Global Pollutant, Academic, "Algal mercury and trace metal accumulation during biofuel production".

Peterson, C. (Presenter & Author), Weiss-Penzias, P. (Author Only), Gustin, M. S. (Author Only), International Conference on Mercury as a Global Pollutant, Academic, "Estimation of mercury dry deposition at three TMDL supersites across Florida, USA".

Huang, J. (Presenter & Author), Miller, M. (Author Only), Gustin, M. S. (Author Only), International Conference on Mercury as a Global Pollutant, Academic, "Integrating multiple methods to better understand the atmospheric chemistry of mercury and mercury dry deposition in the semi arid Basin and Range".

Wright, G. (Presenter & Author), Gustin, M. S. (Author Only), Weiss-Penzias, P. (Author Only), International Conference on Mercury as a Global Pollutant, Academic, "Investigation of mercury deposition and sources of mercury input to the Western United States".

Weiss-Penzias, P. (Presenter & Author), Gustin, M. S. (Author Only), International Conference on Mercury as a Global Pollutant, Academic, "Sources of gaseous oxidized mercury and mercury dry deposition at two southeastern US sites".

Jaffe, D. (Presenter & Author), Gustin, M. S. (Author Only), International Conference on Mercury as a Global Pollutant, Academic, "Measurement and understanding of atmospheric mercury processes".

Miller, M., Gustin, M. S., International Conference on Mercury as a Global Pollutant, Academic, "Effects of reclamation and other control measures on reducing non-point source mercury emissions from industrial scale gold mines", (July 26, 2011).

Briggs, C. (Presenter & Author), Gustin, M. S. (Author Only), International Conference on Mercury as a Global Pollutant, Academic, "Influence of moisture on controlling release of Hg from soils", (July 26, 2011).

Briggs, C. (Presenter & Author), Gustin, M. S. (Author Only), International Conference on Mercury as a Global Pollutant, Academic, "Investigation of mercury release from soils amended with flue gas desulfurization solids".

Gustin, M. S. (Presenter & Author), Pizzaro Barraza, C. (Author Only), Peacock, M. M., International Conference on Mercury as a Global Pollutant, Academic, "Hg bioaccumulation in a contaminated flowing water system-sediment, macroinvertebrate and fish interactions".

Gustin, M. S., CAMNet: Real Time Air Pollution and Monitoring Meeting, Non-Academic, "Investigation of mercury deposition and sources of mercury input to four western national parks and one California State Park", **Invited**.

Weiss-Penzias, P. (Presenter & Author), Gustin, M. S. (Author Only), Peterson, C. (Author Only), EPRI Southeastern US Research Meeting, Non-Academic, "Sources of mercury in dry deposition to the southeastern United States", **Invited**.

Peterson, C. (Presenter & Author), Gustin, M. S. (Author Only), EPRI Southeastern US Research Meeting, Non-Academic, "Use of passive samplers and surrogate surfaces for measurement of atmospheric Hg at 3 Air Monitoring Super Sites established for developing statewide TMDL for Florida", **Invited**.

Gustin, M. S. (Presenter & Author), Weiss-Penzias, P. (Presenter & Author), Fine, R. (Presenter & Author), Nevada Rural Ozone Stakeholder Meeting, Non-Academic, "Update on Progress NVROI project", **Invited**.

2010

Gustin, M. S., Honors Program Great Lecture Series, Academic, "Why do we care about atmospheric Hg?", UNR **Invited**,

Gustin, M. S. (Author Only), Woodward, C. (Presenter & Author), Research Experience for Undergraduates, Academic, "Mercury in tree rings at three sites in Nevada", NSF, UNR.

Briggs, C., Gustin, M. S. (Author Only), American Geophysical Union, Academic, "Effect of

vegetation on mercury volatilization from soils", San Francisco, CA..

Gustin, M. S. (Author Only), Pizzaro, C. (Presenter& Author), Peacock, M. M. (Author Only), American Geophysical Union Annual meeting, Academic, "Hg bioaccumulation in a contaminated flowing water system-sediment, macroinvertebrates and fish interactions", San Francisco, CA..

Gustin, M. S. (Author Only), Eckley, C. (Presenter& Author), Miller, M. (Author Only), Society of Ecological Toxicology and Chemistry, Academic, "Fugitive Hg emissions from two Nevada Gold mines", Portland OR..

Wright, G., Gustin, M. S. (Author Only), National Atmospheric Hg Deposition Network Annual Meeting, "Mercury deposition to 6 locations from the Pacific Coast to the Basin and Range", NADP, Truckee CA.

Gustin, M. S., San Francisco Bay Estuary Institute, Non-Academic, "Potential sources of Hg deposition to California", Berkeley, CA. **Invited.**

Pizzaro, C., Gustin, M. S. (Author Only), Peacock, M. M. (Author Only), Truckee River Water Conference, Non-Academic, "Mercury in abiotic and biotic components of the Truckee River", DRI.

2009

Gustin, M. S. (Presenter & Author), Lyman, S., Weiss-Penzias, P., American Geophysical Union, Academic, "Air mercury concentrations in Reno Nevada USA: Evidence for a free tropospheric source of reactive gaseous mercury", San Francisco, California.

Jew, A. (Presenter & Author), Luong, P., Kim, C., Gustin, M. S., Rytuba, J., Brown, G., American Geophysical Union, Academic, "Evidence for multiple export pathways of mercury from the inoperative New Idria Hg Mine", San Francisco, California.

Marsik, F. (Author Only), Brooks, S., Gustin, M. S., Holsen, T., Landis, M., Prestbo, E., Poissant, L., American Geophysical Union, Academic, "Preliminary Results from a mercury dry deposition measurement methods intercomparison", San Francisco, California.

Gustin, M. S. (Presenter & Author), Eckley, C., Northwestern Mining Association, Non-Academic, "Fugitive Hg emissions from two Nevada Gold Mines", Reno, NV, **Invited.**

Eckley, C. (Presenter & Author), Gustin, M. S., NDEP Report on Fugitive Hg emissions, Non-Academic, "Fugitive mercury emissions from Nevada, USA gold mines", NV Division of Environmental Protection, Reno, NV.

Gustin, M. S. (Presenter & Author), Agricultural and Industrial uses of FGD, Non-Academic, "Mercury release from FGD materials", EPRI/EPA/USDA, Indianapolis Indiana, **Invited.**

Pizzaro, C. (Presenter & Author), Gustin, M. S. (Author Only), Peacock, M. M. (Author Only), Truckee River Symposium, Non-Academic, "Mercury concentrations in abiotic and biotic components of the Truckee River", Reno, NV.

Gustin, M. S. (Presenter & Author), Eckley, C. (Author Only), Geological Society of America, Academic, "Nonpoint source mercury releases to the air from two Nevada Gold Mines", Portland, Oregon.

Gustin, M. S., EPRI Stakeholders Meeting, Non-Academic, "Mercury release from FGD

materials", Beltsville MD, **Invited**.

Gustin, M. S. (Author Only), Eckley, C. (Presenter Only), Hartman, J. S. (Author Only), 9th International Conference on Mercury as a Global Pollutant, Academic, "Evolution of thought on terrestrial ecosystems as a net source or sink for atmospheric Hg", Guizhou, China, **Invited**.

Gustin, M. S. (Author Only), Eckley, C. (Presenter & Author), 9th International Conference on Mercury as a Global Pollutant, Academic, "Fugitive emissions from Nevada Gold Mines", Guizhou, China.

Gustin, M. S. (Author Only), Eckley, C. (Presenter & Author), 9th International Conference on Mercury as a Global Pollutant, Academic, "Testing and application of a dynamic flux chamber", **Invited**, Guizhou, China.

Lyman, S. (Presenter Only), Gustin, M. S. (Author Only), 9th International Conference on Mercury as a Global Pollutant, Academic, "Using surrogate surfaces and models to track gaseous oxidized mercury dry deposition at several sites in the United States", Guizhou, China. **Invited**.

2008

Lyman, S., Gustin, M., Prestbo, E. Kilner, P. Development of surrogate surfaces for measurement of mercury dry deposition Invited presentation National Atmospheric Deposition Network Annual meeting Madison, WI.

Gustin, M. Mercury release from Coal Combustion products and product amended soils, Invited workshop speaker Electric Utility Consultants Conference Salt Lake City.

Markee, M., Gustin, M.S., Donaldson, S. Investigation of Causal Factors for Elevated Hg Concentrations in fish of Nevada's Reservoirs and Statewide Education on Fish Consumption Advisories for Hg NAES Priority Grants Progress Meetings, Reno, NV,

Gustin, M. , Measurement of methyl mercury released from constructed wetlands and comparison with data collected in natural stream reaches USDA-CSREES National Water Conference, Reno, NV

Gustin, M. S. Mercury Air Concentration Monitoring in Nevada and Utah, Great Basin Hg working group meeting Reno, NV.

Lyman, S. Gustin, M. S. Characterizing Air Hg Concentrations Using Passive Samplers and Dry Deposition with Surrogate Surfaces, Great Basin Hg working group meeting Reno, NV

Eckley, C., Gustin, M.S., Miller, M., Marsik, F., Fugitive Hg Emissions from Nevada Gold Mines Overview and Update, Great Basin Hg working group meeting Reno, NV

Donalson, J., Gustin, M. S. Mercury and Carbon and Nitrogen Stable Isotopes in Truckee River Fish NSF EPSCoR Undergraduate Research Symposium, Reno, NV.

Eckley, C., Gustin, M.S., Miller, M., Marsik, F., Progress Report on the Measurement of Hg emissions from two Nevada Gold Mines, NDEP Grant Steering Committee Meeting

2007

Gustin, M. S., Atmospheric Mercury Speciation and Deposition at the Great Salt Lake, Great Salt Lake Technical Advisory Team, Invited, Salt Lake City.

- Peterson, C., Gustin, M. S., Atmospheric Hg Speciation and Deposition at the Great Salt Lake Utah", Truckee River Symposium, NV Water Resources Association, Poster, Reno, NV.
- Lyman, S., Gustin, M. S., Development of samplers for passive measurement of Atmospheric Hg speciation and dry deposition, Air Quality VI , Arlington VA. **Invited.**
- Gustin, M. S., Ericksen, J., Xin, M., Ladwig, K. Investigation of Hg release from FGD materials and coal combustion product amended soils, Air Quality VI , Arlington VA.
- Gustin, M. S., Stamenkovic, J., Lyman, S., Weisberg, P. J. , Rytuba, J. , Engle, M., Lindberg, S., Kuiken, T., Zhang, H., Update on our understanding of 1) natural geologic source Hg emissions and 2)the role of natural background soils as sources and sinks for atmospheric Hg. Air Quality VI , Arlington VA. **Invited.**
- Gustin, M. S., Lyman, S. , Prestbo, E. , Kilner, P. , Development of surrogate surfaces for assessing dry deposition of atmospheric Hg, National Atmospheric Deposition Program Technical Committee Meeting Boulder CO.
- Gustin, M. S., 2007The mercury biogeochemical cycle", Stack testing/test characterization for particulate matter and Hg Workshop presentation, State of Nevada, Carson City, NV. **Invited.**
- Ellis, T., Gustin, M. S., Laboratory Testing and Analyses of Passive Atmospheric Mercury (Hg) Samplers, NSF EPSCoR Summer Scholar Poster Presentation Reno, NV.
- Gustin, M. S., Xin, M., Ladwig, K., Investigation of Hg release associated with FGD materials, World of Coal Ash, Cincinnati Ohio, **Invited.**
- Gustin, M. S. Ericksen, J. Xin, M., Mercury releases to the atmosphere from ash amended soils, World of Coal Ash, Cincinnati Ohio, **Invited.**
- Gustin, M. S., Natural sources and sinks of atmospheric Hg and consideration of the significance of dry deposition, EPRI Environmental Area Sector Council Meetings San Francisco, CA.
- Gustin, M. S., Mercury in coal where does it come from where does it go. EPRI Environment Area Sector Council Meetings, San Francisco.
- Lyman, S., Gustin, M. S., Prestbo, E., Kilner, P. Development of Samplers for Passive Measurement of Atmospheric Mercury Speciation and Dry Deposition, Symposium on Air Quality Measurement Methods and Technology Air and Waste Management Association, San Francisco.
- Lyman, S., Gustin, M. S. Atmospheric mercury speciation and deposition in northern Nevada Nevada Division of Environmental Protection, Carson City. **Invited.**

2006

- Seigneur, C., Lohman, K, Gustin, M., Lindberg, S. Sensitivity of the Global Atmospheric Cycling of Mercury to Emissions, 8th International Conference on Mercury as a Global Pollutant, Madison WI
- Fay, L., Gustin, M. Mercury accumulation in wetland plants: Is it from the atmosphere, water and/or sediments, Poster, 8th International Conference on Mercury as a Global Pollutant, Madison WI

Gustin, M., Xin, M., Ladwig, K Mercury exchange between air, water and coal combustion byproducts, 8th International Conference on Mercury as a Global Pollutant, Poster, Madison WI.

Ericksen, J., Gustin, M Mercury flux from soils amended with ash materials, Poster, 8th International Conference on Mercury as a Global Pollutant, Madison WI.

Ericksen, J., Gustin, M, Lindberg, S., Krabbenhoft, D., Olund, S., Assessing the potential for re-emission of mercury deposited in precipitation from arid soil using a stable isotope, Poster, 8th International Conference on Mercury as a Global Pollutant, Madison WI.

Stamenkovic, J., Gustin, M., Obrist, D., Arnone, J., Verburg, P., Johnson, D., Environmental controls on mercury flux from ecosystem components at different temporal scales 8th International Conference on Mercury as a Global Pollutant, Madison WI.

Gustin, M. S., Marsik, F., Obrist, D Air-surface exchange of mercury in terrestrial ecosystems 8th International Conference on Mercury as a Global Pollutant, Madison WI.

Stamenkovic, J., Gustin, M. S. Application of EcoCELL technology for quantifying gaseous elemental mercury fluxes over background vegetated terrestrial monoliths American Chemical Society 61st Northwestern Section meeting **Invited**.

Lyman, S., Gustin, M., Prestbo, E., Use of polysulfone membranes to measure atmospheric deposition of reactive mercury species American Chemical Society 61st Northwestern Section meeting **Invited**.

Engle, M., Gustin, M., Johnson, D. Ecosystem-level distribution of mercury in vegetation, litter, and soil: potential sources of atmospheric mercury flux from fires, Poster, 8th International Conference on Mercury as a Global Pollutant, Madison WI.

Engle, M., Gustin, M. Estimating Mercury Emissions from Geothermal Systems and Volcanoes for the Conterminous United States, Poster, 8th International Conference on Mercury as a Global Pollutant, Madison WI.

Todd Kuiken, Zhang, H. Gustin, M., Lindberg, S. Natural background levels of mercury exchange from an eastern deciduous forest floor: A year long study within Standing Stone State Forest in Overton county Tennessee 8th International Conference on Mercury as a Global Pollutant, Madison WI.

Todd Kuiken, Sedinger, B. Zhang, H. Gustin, M., Lindberg, S. Air-forest floor mercury exchange along the eastern Seaboard and New England, Poster, 8th International Conference on Mercury as a Global Pollutant, Madison WI.

Brown, S., Saito, L., Gustin, M. Modeling mercury in a tributary to the Truckee River, Poster, Nevada Water Resources Association February Mesquite NV.

2005

Brown, S., Saito, L., Gustin, M A Mercury model for Steamboat Creek, Nevada Water Resources Association 2005 Truckee River Symposium DRI Reno, NV.

Gustin, M.S. Steamboat Creek Restoration Research Delta Tributaries Mercury Council Sacramento CA **Invited**.

- Gustin, M.S., Engle, M., Ericksen, J., Fay, L., Millhollen, A., Stamenkovic, J. Mercury in Coal: Where does it come from? National Geological Society of America Meeting, Salt Lake City, **Invited.**
- Gustin, M.S., Johnson, D., Weisberg, P., Rytuba, J., Lindberg, S., Zhang, H., Ericksen, J., Engle, M., Fay, L., Gigliani, T., Kuiken, T., Lyman, S., Xin, Mei Progress summary: Assessment of natural source (geologic and vegetation) mercury emissions: Speciation, Mechanisms and Significance, Air Quality V, Arlington, VA.
- Gustin, M., Xin, M., Ladwig, K., Pflughoeft, D., Ericksen, J., Swain, E., Coal combustion by products: Do we need to worry about Hg releases, Air Quality V, Arlington, VA.
- Brown, S.L., Saito, L., Gustin, M. A mercury model for Steamboat Creek, Nevada Water Environmental Association: 2005 Truckee River Symposium, Reno Nevada.
- Chavan, P.V., Dennett, K.E., Marchand, E.A., Spurrkland,L., Stamenkovic, J., Gustin, MS. Assessment of Water Quality Parameters and Mercury in Constructed Wetlands The 8th International In Situ and On-Site Bioremediation, Baltimore, Maryland
- Millhollen, A.G., Gustin, M.S. Quantifying foliar mercury accumulation and exchange using varying atmospheric and soil concentrations Geological Society of America, Cordilleran Section meeting, San Jose, CA **Invited.**
- Chavan, R. V., Gustin, M.S., Dennett, K. E. Assessment of mercury transformation in constructed wetlands, Geological Society of America, Cordilleran Section meeting, San Jose, CA, **Invited.**
- Ericksen, J.A., Gustin, M.S., Lindberg, S.E., Olund, S. D., Krabbenhoft, D.P. Assessing the potential for re-emission of mercury deposited in precipitation from arid soils using a stable isotope, Geological Society of America, Cordilleran Section meeting, San Jose, CA **Invited.**
- Gustin, M., Engle, M., Ericksen, J, Xin, M., Krabbenhoft, Lindberg, S., Olund, S., Rytuba, J. New insights into mercury exchange between air and substrate. International Goldschmidt Conf. Moscow Idaho **Invited.**
- Gustin, M., Chavan, R., Stamenkovic, J., Ericksen, J., Brown, S., Saito, L., Dennett, K., Marchand, E., Donaldson, S. The potential for methyl mercury production in constructed wetlands and a riparian setting International Goldschmidt Conference Moscow Idaho **Invited**
- Gustin, M., Johnson, D., Weisberg, P., Rytuba, J., Lindberg, S., Zhang, H. Ericksen, J., Engle, M., Fay, L., Gigliani, T., Kuiken, T., Lyman, S., Xin, M., Assessment of natural source (geologic and vegetation) mercury emissions: Speciation, mechanisms and significance, International Air Quality V meeting, Arlington VA **Invited**
- Xin, M., Gustin, M., Ladwig, K. Mercury release from coal combustion products International World of Coal Ash meeting Lexington KY.
- Xin, M., Gustin, M., Ladwig, K. Mercury Release from coal combustion by-products. Electric Utilities Environmental Conference Tucson AZ.
- Gustin, M., Lindberg, S. Why do we care about terrestrial sources and sinks of atmospheric Hg? Electric Utilities Environmental Conference Tucson AZ.

Gustin, M., Chavan R., Dennett, K., Marchand, E. Saito, L., Donaldson, S. Use of constructed wetlands to aid decision making on restoration methods for a mercury contaminated watershed USDA-CSREES National Water Quality Conference San Diego CA

2004

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 Forest of Tennessee 56th Southeast Regional Meeting American Chemical Society.

Stamenkovic J., Obrist D, Arnone JA, Schorran DE, Verburg PSJ, Johnson DW, Gustin MS. Mercury emissions from tallgrass prairie ecosystems. 89th Annual Meeting of the Ecological Society of America, Portland, Oregon (USA).

Gustin, MS, Zehner, R. Stamenkovic, J. Experimental examination of the effect of precipitation and moisture content on mercury emission from soils, 7th International Conference on Mercury as a Global Pollutant, Ljubljana, Slovenia.

Gustin, MS, Ladwig, K, Xin, M., Zehner, R. Assessment of the significance of mercury release from coal fly ash, Poster, 7th International Conference on Mercury as a Global Pollutant, Ljubljana, Slovenia.

Engle, MA, Gustin, MS, Goff, F, Janik, CJ, Counce, DA, Rytuba, J. Atmospheric mercury emission from substrate and fumaroles associated with three hydrothermal systems in the western United States, Poster, 7th International Conference on Mercury as a Global Pollutant, Ljubljana, Slovenia.

Engle, MA, Gustin, MS, Lindberg, SE, Gertler, A. Effects of atmospheric oxidants on Hg release from substrate, Poster, 7th International Conference on Mercury as a Global Pollutant, Ljubljana, Slovenia.

Obrist, D, Gustin, MS, Arnone, JA, Johnson, DW, Schorran, DE, Verburg PSJ. Large annual Hg emissions over tallgrass prairie grasslands indicate vegetated terrestrial ecosystems to be sources of Hg to the atmosphere, 7th International Conference on Mercury as a Global Pollutant, Ljubljana, Slovenia.

Gustin, MS, Lindberg, SE. Terrestrial Hg fluxes is the net exchange up or down Invited presentation International workshop on Harmonization of Mercury Measurement Methods and Models to Assess Source Receptor Impact on Air Quality and Human Health Maratea Italy.

2003

Obrist D, Gustin MS, Arnone JA, Schorran DE, Verburg PSJ, Johnson DW. Large annual Hg emissions over Tallgrass Prairie grasslands indicate higher natural loading of Hg to the atmosphere than previously estimated. Poster Presentation; first Swiss Geosciences Meeting, Basel, Switzerland.

Gustin, M. Ladwig, K Mercury releases from coal fly ash: are they significant? Coal Ash Association, Las Vegas, NV

MS Gustin K Ladwig. Release of mercury to air from coal fly ash MS Gustin K Ladwig 2003 International Ash Utilization Conference Lexington KY

- Walker, M., Benson, M., Gustin, M.S. Arsenic and Arsenic (III) in tap water samples: Implications for exposure in Churchill County, Nevada, 2003 Annual Water Resources Conference, American Water Resources Association, San Diego, CA.
- Gustin, M. Overview of Hg and importance of atmospheric deposition, US EPA Region IX multimedia workshop: "Air Deposition in the Pacific Southwest: Understanding the Impacts on Water Quality, San Francisco, CA, **Invited**
- Gustin, M Quantifying the role of significant natural sources and sinks in the biogeochemical cycle of mercury, EPA STAR mercury fate and transport final progress review workshop, Washington, D.C. **Invited**.
- Obrist, D. Gustin, M.S. Arnone, J.A., Schorran, D.E. , Verburg, P.S., Johnson, D.W. Vegetated terrestrial ecosystems are large sources of mercury to the atmosphere Eos Trans. AGU 84(46), Fall Meeting Supplement Abstract B51D-1002, San Francisco.
- Engle, M.A., Gustin, M.S., Lindberg, S.E., Gertler, A.W. Exacerbation of atmospheric mercury emissions from substrate by atmospheric oxidants. Eos Trans. AGU 84(46), Fall Meeting Supplement Abstract B21D-0750, San Francisco.
- Zehner, R, Gustin, M. Quantifying mercury emissions from base and precious metal deposits and oil and gas fields, Air and Waste Management Association, San Diego, CA **Invited**.
- Stamenkovic, J. Gustin, M.S., Dennett, K. E. Net methylmercury production in constructed wetlands with three experimental designs at Steamboat Creek (Nevada, USA), American Society of Limnology and Oceanography, Salt Lake City, UT **Invited**
- Thomas, B.A. Gustin, M.S. Identifying the sources of total and methyl mercury in the anthropogenically impacted Steamboat Creek, Nevada, USA, American Society of Limnology and Oceanography, Salt Lake City, UT **Invited**
- Gigliani, A. D., Gustin, M.S. Development of a mercury mass balance for the Incline Creek Watershed, Lake Tahoe, NV, American Society of Limnology and Oceanography, Salt Lake City, UT **Invited**.

2002

- Gustin, M.S., Ladwig, K., Gigliani, T., Piper, J. Measurement of the potential for mercury releases from coal fly ash, Conference proceedings for Air Quality III meeting, Arlington, VA.
- Gustin, M. S., Lindberg, S.E. Unraveling the role of natural ecosystems in the biogeochemical cycle of Hg, Conference proceedings for Air Quality III meeting, Arlington, VA.
- Gustin, M.S., Nacht, D., Gigliani, T., and Engle, M. Speciation of mercury in the atmosphere above naturally and anthropogenically mercury enriched substrate. Extended abstracts for American Chemical Society National Meeting, Orlando, FL, **Invited**.
- Gustin, M.S., Benesch, J.A., Schorran, D.E., Johnson, D.A., Lindberg, S.E., Coleman, J. Investigation of the role of plants in the biogeochemical cycling of mercury using large mesocosms, Extended abstracts for American Chemical Society National Meeting, Orlando, FL, **Invited**.
- Gustin, M.S. Quantifying the role of significant sources and sinks in the biogeochemical cycle of mercury, EPA Science Forum, Washington, DC, **Invited**

Gustin, M.S., Benesch, J., Frescholtz, T., Schorran, D., Johnson, D., Lindberg, S.E., Coleman, J. Forests as sources of new mercury to ecosystems, American Society of Limnology and Oceanography meeting, Victoria, BC.

Brown, G.E., Kim, C.S., Shaw, S., Lowry, G.V., Rytuba, J.J. Gustin, M. S., Processes controlling the chemical/isotopic speciation and distribution of mercury from contaminated mine sites, American Chemical Society National Meeting, Orlando, FL, **Invited**.

Fitzgerald, B., M.J. Walker, M. Gustin, J. Davison. Arsenic in domestic wells in Churchill County, Nevada. Nevada Water Resources Association Annual Conference, Las Vegas, NV.

Gustin, M.S. The significance of mercury emissions from natural sources, Electric Utilities Environmental Conference, Tucson, AZ.

2001

Walker, M., Gustin, M. Rank and parametric-based approaches to interpreting grab sampling data for total maximum daily load determination, Symposium volume for 7th Federal Interagency Sedimentation Conference, Albuquerque, NM.

Nacht, D., Gustin, M.S., Engle, M., Zehner, R.E., Gigliani, T., Quantifying total and reactive gaseous mercury emissions from the Sulphur Bank Mercury Mine Superfund Site, Northern CA., American Geophysical Union National Meeting, San Francisco, CA.

Frescholtz, T.F., Gustin, M.S., Schorran, D.E., The role of vegetation in mercury cycling at mercury enriched mine sites, American Geophysical Union National Meeting, San Francisco, CA.

Gustin, M. Sexauer, Coolbaugh, M., Engle, M., Fitzgerald, B., Lindberg, S.E., Nacht, D., Rytuba, J., Zehner, R. The significance of mercury emissions from geologic sources, Sixth International Conference on Hg as Global Pollutant, Minamata, Japan.

Gustin, M. Sexauer, Benesch, J. A., Schorran, D.E., Johnson, D.A., Lindberg, S.A., Coleman, J. Assessing the effect of plants on mercury emissions from substrate, Sixth International Conference on Hg as Global Pollutant, Minamata, Japan.

Benesch, J. A., Gustin, M.A., Schorran, D.E., Coleman, J., Johnson, D.A., Lindberg, S.E., Determining the role of plants in the biogeochemical cycling of mercury on an ecosystem level, Sixth International Conference on Hg as Global Pollutant, Minamata, Japan.

Johnson, D.W., Benesch, J.A., Gustin, M.S., Schorran, D.E., Coleman, J., Lindberg, S.E., Soil gaseous Hg concentrations: Evidence against diffusive control of flux, Sixth International Conference on Hg as Global Pollutant, Minamata, Japan.

Gustin, M. Sexauer, Coolbaugh, M., Engle, M., Fitzgerald, B., Lindberg, S., Nacht, D., Rytuba, J., Zehner, Putting into perspective mercury emissions from geologic sources, E.P.A. sponsored Workshop on the fate, transport and transformation of mercury in aquatic and terrestrial environments, West Palm Beach FL, **Invited**

Gustin, M.S., Benesch, J.A., Schorran, D.E., Johnson, D.A., Lindberg, S.E., Coleman, J. Assessing the role of plants in the biogeochemical cycle of mercury, E.P.A. sponsored Workshop on the fate, transport and transformation of mercury in aquatic and terrestrial environments, West Palm Beach FL, **Invited**.

2000

Lindberg, S.E., Zhang, H., Gustin, M.S., 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, Extended Abstracts for Assessing and Managing Mercury from Historic and Current Mining Activities, San Francisco, CA.

Zehner, R.E. and Gustin, M.S. Estimation of mercury vapor flux from natural geologic sources in Nevada, Extended Abstracts for EPA Meeting on Assessing and Managing Mercury from Historic and Current Mining Activities, San Francisco, CA.

Gustin, M.S., 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, Extended Abstracts for EPA Meeting on Assessing and Managing Mercury from Historic and Current Mining Activities, San Francisco, CA.

Sladek, C., Gustin, M.S. Evaluation of methods for predicting potential mobility of mercury in waste associated with historic mercury and gold mining, Extended Abstracts for EPA Meeting on Assessing and Managing Mercury from Historic and Current Mining Activities, San Francisco, CA, Nov. 2000.

Gustin, M. S., Coolbaugh, M.F., Engle, M.A. Emission of mercury to the atmosphere from natural sources in Nevada and California, Proceedings for 10th International Conference on Heavy Metals in the Environment, Ann Arbor, MI.

Sladek, C., Gustin, M.S. Investigation of sequential extraction methods for determination of mercury species in sediments, Proceedings for 10th International Conference on Heavy Metals in the Environment, Ann Arbor, MI.

Engle, M.A., Temple, R. N. Gustin, M.S. 2000 Hydrogeochemistry of groundwaters associated with epithermal hot-spring-type Hg deposits, Proceedings for Fifth International Conference on Acid Rock Drainage, Denver, CO.

Gustin, M.S. The role of naturally mercury enriched substrate and background substrate in the global cycling of mercury, Geologic Society of America National Meeting, Reno, NV.

Sladek, C., Gustin, M.S. Evaluation of methods for predicting the potential mobility of mercury in mine waste, Geologic Society of America National Meeting, Reno, NV.

1999

Benesch, J.B., Gustin, M.S., Cahill, T., Seiber, J.N., Quashnick, J. Uptake of trifluoroacetic acid in plants via root and atmospheric pathways, Society of Environmental Toxicology and Chemistry 20th Annual meeting, Philadelphia, PA.

Gustin, M.S. Are sources other than anthropogenic point sources significant contributors to the atmospheric mercury budget, National Atmospheric Deposition Network National Technical Committee meeting, Sacramento, CA.

Cahill, T., Benesch, J., Gustin, M., Seiber, J. Simplified method for trace analysis of trifluoroacetic acid in plant, soil, and water samples using headspace gas chromatography, American Chemical Society Fall meeting, New Orleans, LA.

Gustin, M.S. Emissions of Mercury from contaminated mine waste, Geological Society of America-Cordilleran Section-Session on mercury in the environment, Berkley, CA, **Invited**.

Gustin, M.S, Lindberg, S.E. Assessing the contribution of natural resources to regional atmospheric mercury budgets, 5th International Conference on Mercury as a Global Pollutant, Rio de Janeiro, Brazil.

Gustin, M.S. Lindberg, S.E. Allan, M.A. Ebinghaus, R. Edwards, G. Majewski, M. Marsik, F. Poissant, L., Rasmussen, P., Schaedlich, F., Sommer, J., Turner, R., Vette, A., Wallschlaeger, D. Desert STORMS: A field intercomparison of methods utilized for measurement of mercury flux from terrestrial landscapes, 5th International Conference on Mercury as a Global Pollutant, Rio de Janeiro, Brazil.

Gustin, M.S., Lindberg, S.E. Assessing the emission of mercury from naturally enriched terrestrial surfaces. Electric Utilities Environmental Conference, Tucson, AZ.

1998

Gustin, M.S., Maxey, R.A., Rasmussen, P. and Biester, H. Mechanisms influencing the volatile loss of mercury from soil, Symposium volume of the Air and Waste Management Association on the Measurement of Toxic and Related Air Pollutants, Cary, NC.

Taylor, G.E., Beck, K., Tarnay, L., Gustin, M. Dry deposition of trace pollutant gases to high elevation forests in the southern Sierra Nevada Mountains: Results from Process-Level modeling, In Proceedings of the 5th International Watershed Conference, Reno, NV, National Watershed Coalition.

Gustin, M.S. Nevada STORMS, Summary of data, Mercury experts workshop hosted by EPRI, Canadian Geological Survey and University of Guelph, Guelph, Canada.

Gustin, M.S. Light enhancement of mercury emissions, Mercury experts workshop hosted by EPRI, Canadian Geological Survey and University of Guelph, Guelph, Canada.

Taylor, G.E., Beck, K., Tarnay, L., Gustin, M. Dry deposition of trace pollutant gases to high elevation forests in the southern Sierra Nevada Mountains: Results from Process-Level modeling, 5th International Watershed Conference, Reno, NV, National Watershed Coalition.

Engle, M., Tempel, R., Wallace, A., Gustin, M. Natural levels of mercury in groundwaters associated with opalite-hosted mercury deposits, Ivanhoe Mining district, Geological Society of America National Meeting, Toronto, Canada.

Austin, K., Gustin, M.S., Tarnay, L. Application of GIS for constraining mercury emissions from geologically enriched areas, Geological Society of America meeting, Toronto, Canada.

1997

Gustin, M.S., Lindberg, S.E. Assessing the contribution of natural sources to regional atmospheric mercury budgets, Conference on Managing Hazardous Air Pollutants, Washington, D.C.

Gustin, M.S. Natural sources of atmospheric mercury, Symposium on Mercury Elimination and Reduction: Towards a North American Partnership, Toronto, Canada, **Invited**.

1996

Gustin, M.S., Taylor, G.E., Jr. Light induced flux of mercury from substrate, Fourth International Conference on Mercury as a Global Pollutant, Hamburg, Germany.

Leonard, T.L., Gustin, M.S., Taylor, G.E., Jr. Mercury Volatilization from Riparian Vegetation, Fourth International Conference on Mercury as a Global Pollutant, Hamburg, Germany.

1995

Gustin, M.S., Taylor, G.E., Jr. Mercury evasion to the atmosphere: effects of temperature, wind velocity and substrate mercury concentration, American Chemical Society 210th National Meeting, Chicago, IL.

Grant and Contracts

Summary of current funding: Competitive Grants as PI:	\$3,076,655
Competitive Grants as Co-PI:	\$ 1,070,014
Federal Funding as PI and Co-PI:	\$ 338,791
State and County funding as PI:	\$ 2,132,783
Private funding as PI	\$ 1,083,688

CURRENT PROJECTS

Gustin, Mae (PI) Understanding sources of Hg deposited to Florida Atmospheric Research and Analysis, Inc. \$38,788 1/15/14-12/31/14 Noncompetitive

Gustin, Mae S (Principal), Seth, Lyman (Utah State University Co-Principal). Collaborative Research: Refining and Testing Methods for Identifying Gaseous Oxidized Mercury in air. National Science Foundation \$559,049 total \$304,442 to UNR 8/15/13-12/31/15 Competitive

Mae Gustin (Principal) Amendment to the Nevada Rural Ozone Research Initiative. Nevada Division of Environmental Protection. \$657,252 9/1/10-12/31/17

Mae Gustin (Principal), Jaffe, Daniel (collaborator) Nevada Rural Ozone Research Initiative. Nevada Division of Environmental Protection. \$ 927,892. 9/1/10-12/31/17 Noncompetitive

Mae Gustin. Pacific –Great Basin Mercury Transect. EPRI (cooperation with National Park Service). \$168,079. 7/15/10-5/31/15 Competitive

PAST PROJECTS

Dan Jaffe (University of Washington), Mae Gustin, Bob Talbot (University of Houston), Tony Hynes (University of Miami, Daniel Obrist (Desert Research Institute). Collaborative Research: The Reno Atmospheric Mercury Inter-comparison Experiment (RAMIX). National Science Foundation. \$157,637 (UNR amount) \$700,000 Total 5/1/11-4/30/2012 Competitive

Mae Gustin. Phase two –Fugitive Hg Emission Project Investigating Hg Releases to the Air Associated with Nevada Gold Mines. Nevada Division of Environmental Protection and NV mining companies. \$148,586. 10/1/11-5/30/2012. Noncompetitive

John Cushman (UNR), Eric Marchand (UNR), Mae Gustin. Nevada Renewable Energy Consortium: Municipal Wastewater for Microalgae Biofuel Feedstock Production. Department of Energy. \$250,000 (\$53,092 for Gustin). 10/1/10-9/30/2011. Competitive

Mae Gustin, Sue Donaldson (UNR-Cooperative Extension). Investigation of Potential for Methyl Mercury Production and Inputs From Irrigation Drains in Nevada. United States Department of Agriculture-HATCH Grant. \$107,845. 7/1/10-6/30/2012. Competitive

Mae Gustin. Measurement of Hg dry deposition and air concentrations at 4 national parks. National Park Service and EPRI. \$205,291. 6/14/10-12/31/2012. Competitive

Mae Gustin. Integrating Multiple Methods to Understand the Atmospheric Chemistry of Mercury and Mercury Dry Deposition from the Pacific to the Basin and Range. National Science Foundation. \$250,582. 10/1/09-10/30/2012. Competitive

Mae Gustin, Dan Jaffe (University of Washington). Workshop on reducing uncertainty in the measurement of atmospheric Hg. National Science Foundation. \$32,400. 10/1/08-12/30/09. Competitive

Mae Gustin. Measurement of Hg dry deposition. Electric Power Research Institute. \$158,028. 6/1/07-12/30/09. Competitive

Mae Gustin. Development of broadly deployable methods for quantifying atmospheric Hg speciation in urban and rural settings in Nevada. Sponsored by U. S. EPA Air Toxics program through NDEP. \$413,890. 10/1/06-12/31/09. Competitive

Mae Gustin. Measurement of Hg dry deposition and air concentrations using surrogate surfaces and passive samplers to aid development of a TMDL for Hg for the State of Florida. EPRI-Electric Power Research Institute. \$179,181. 6/1/09-3/30/2012. Competitive

Mae Gustin-PI, Frank Marsik (University of Michigan)-Co PI. Characterization of fugitive emissions from naturally Hg enriched mining disturbed and undisturbed substances. Nevada Division of Environmental Protection and NV mining companies. \$339,943. 4/1/07-6/30/2012. Competitive

Mary Peacock (UNR), Mae Gustin. Population dynamics of the native fishes in the mainstem Truckee River. United States Fish and Wildlife Service. \$313,419. 6/1/07-6/30/11. Noncompetitive

Mae Gustin. Measurement of Hg release from FGD amended soils. EPRI-Electric Power Research Institute. \$284,911. 6/1/09-12/31/11. Noncompetitive

Mae Gustin-PI, Dale Johnson (UNR), Jay Arnone (Desert Research Institute), Alan Gertler (Desert Research Institute). Interactions of atmospheric elemental mercury with vegetation and soils: Quantifying the role of natural ecosystems as sources and sinks. National Science Foundation. \$464,676. 8/15/02-8/14/05. Competitive

Mae Gustin-PI, Dale Johnson, Richard Zehner Collaborators: Steve Lindberg (Oak Ridge National Laboratory), Hong Zhang (Tenn. Tech). Assessment of natural source mercury emissions: Speciation, mechanisms and significance. U. S. Environmental Protection Agency STAR Grant. \$891,545. Competitive

Mark Walker (UNR)-PI, Douglass Shaw, Mae Gustin, Jay Davidson. Arsenic in Churchill County, Nevada domestic water supplies. U. S. Department of Agriculture. \$372,500. Competitive

Keith Dennet (UNR)-PI, Mae Gustin, Eric Marchand (UNR). Should constructed wetlands be incorporated into proposed flood control projects for the Truckee River? U.S. Environmental

- Protection Agency Wetlands Protection Development Grant. \$114,532. 7/02-12/04. Competitive
- Mae Gustin. Scaling up natural source mercury emissions at local and regional scales. Electric Power Research Institute (EPRI). \$215,566. 02/00 to 01/03. Competitive
- Glenn Miller (UNR)-PI, Mae Gustin Collaborators: Bob Hall (U.S. EPA), Dave Jones (U.S. EPA) and Joel Pedersen (U.S. EPA). Mercury Emissions from Hard Rock Mining. U.S. Environmental Protection Agency Region 9. \$160,500. 8/02-7/05. Noncompetitive
- M. Walker (UNR)-PI, Douglas Shaw, M. Gustin. Risk analysis and management for Churchill County, Nevada private water supplies. U. S. Department of Agriculture Cooperative State Research Extension and Education Office. \$140,000. 6/02-6/04. Competitive
- Mae Gustin-PI, Mark Walker (UNR), Sue Donaldson (UNR-Cooperative Extension). An investigation of nonpoint source mercury pollution in Steamboat Creek and the Truckee River, NV. Nevada Department of Environmental Protection. \$29,555. 9/01-6/02. Competitive
- Mae Gustin. Mercury emissions from coal combustion fly ash. Electric Power Research Institute. \$39,115. 9/01-3/03. Noncompetitive
- Gordon Brown of Stanford University-PI Mae Gustin. Processes controlling the chemical/isotopic speciation and distribution of mercury from contaminated mine wastes. U.S. Environmental Protection Agency STAR Grant. \$700,000. 12/99-12/03. Competitive
- Mae Gustin-PI, Dale Johnson, Jim Coleman collaborator: Steve Lindberg ORNL. Determining the role of plants and soils in the biogeochemical cycling of mercury on an ecosystem level. EPA-EPSCoR. \$508,000. 9/99-7/03. Competitive
- Mae Gustin. Mercury emissions from mine waste. United States Geological Survey. \$13,000. 10/99-12/03. Noncompetitive
- M. Walker-PI, J. Davidson, M. Gustin. Arsenic in Churchill County, Nevada, Private Water Supplies. Nevada Agriculture Experiment Station-UNCE. \$10,000. 7/01-6/02. Competitive
- Mae Gustin-PI, Jerry Qualls. Mercury sources and methyl mercury production in Nevada streams and rivers. National Science Foundation EPSCoR Seed Grant. \$25,000. 8/99-7/02. Competitive
- Mae Gustin. Atmospheric Hg speciation at Sulfur Bank Superfund Site, California. U. S. Environmental Protection Agency Region 9. \$30,406. 5/01-8/01. Noncompetitive
- Mae Gustin. Mercury emissions from Lahontan Reservoir. CH2M Hill and EPA Region 9. \$2,500. 6/01-8/01. Noncompetitive
- Mae Gustin. An assessment of mobility and bioavailability of arsenic in surface water, pore water and sediments of the lower Humboldt River System. Bureau of Reclamation. \$15,000. 9/99-4/30/02. Noncompetitive
- Mae Gustin. Characterization of mercury concentrations in biota, waters and sediments of Steamboat Creek. Nevada Division of Environmental Protection. \$6,900. 6/00-6/01. Competitive

Mae Gustin. Assessment of water quality conditions and mercury on macroinvertebrate communities Stillwater National Wildlife Refuge, Nevada. U. S. Fish and Wildlife Service. \$16,000. 6/98-6/01. Noncompetitive

Sue Donaldson, Sherman Swanson, Mae Gustin. Assessment of the sources and forms of mercury in Steamboat Creek and the potential effects of stream restoration on mercury bioavailability. U.S. Department of Agriculture. \$10,000. 4/1/99-3/31/01. Competitive

Mae Gustin. Light enhanced mercury volatilization from substrate. U. S. Environmental Protection Agency STAR Grant. \$302,000. 12/97-12/00. Competitive

James Seiber-PI, Mae Gustin. Study of deposition of trifluoroacetic acid and evaporation and exposure to plants in seasonal wetlands. National Science Foundation. \$400,000. 6/97-12/99. Competitive

Mae Gustin. International field intercomparison of measurement of mercury emissions from naturally enriched substrate- Nevada STORMS Project. Electric Power Research Institute. \$98,000. 4/98-12/00. Noncompetitive

Mae Gustin. Development of a budget for mercury in waters of the Upper Carson River Watershed. Department of the Interior-Geological Survey NIWR Grant. \$14,085. 3/01/99-2/28/00. Competitive

Projects with all work done at UNR prior to tenure track appointment

Jim Seiber-PI, Glenn Miller, George Taylor, Mae Gustin. Atmospheric transport and deposition of organophosphate and other pesticides as input to Sierra Nevada Surface waters. U.S. Department of Agriculture. \$310,000. 1996- 1999. Competitive

Mae Gustin. Mercury speciation in substrate- Field method demonstration plan. Environmental Protection Agency. \$35,000. 6/97-05/98. Noncompetitive