

## **Dr. Mélida Gutiérrez**

**Department of Geography, Geology and Planning  
Missouri State University**

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### **EDUCATION**

Ph.D. in Geohydrology. University of Texas at El Paso (UTEP), graduated 1992.  
Postgraduate in Environmental Science, Int. Institute of Hydrology, The Netherlands, 1985.  
M.Sc. in Biological Wastewater Treatment, University of Karlsruhe, Germany, 1979.

### **WORK EXPERIENCE**

1993-to date: Missouri State University (MSU), Geography, Geology and Planning Dept.

### **COURSES TAUGHT AT MSU**

Physical Geology; Earth Science for Teachers; Water Resources, Environmental Geology, Principles of Geochemistry, Groundwater Contamination, and Research in Geology.

### **RESEARCH AREAS**

Research has focused on soil and water contamination, stream water quality, geochemistry of natural waters, geochemical modeling of carbon sequestration, and earth science education.

### **GRADUATE STUDENTS PROJECTS (PAST 7 YEARS)**

- 2017 – M.S. Geospatial Science, Andrew Schiller. Bush Honeysuckle: Thought it as a good idea at the time.
- 2015 – MNAS, Justin Drane, Earth Science activities designed to improve High School student comprehension
- 2014 – M.S. Secondary Education – Earth Science, Teresa Wiley. Field trips enhance teaching of a college-level introductory course in geology.
- 2014 - M.S Geospatial Science, Jessica Peebles, Mapping Soil Lead Contamination in the Tri-State Mining District, Turkey Creek, Missouri.
- 2014 - M.S Geospatial Science, Jennifer Kissel. Metal accumulation in native plants growing near abandoned mine tailings, Springfield Missouri.
- 2011 - M.S Geospatial Science. Emily Sturnfield. *E.Coli* Incidence and Sources in the Dry Sac Watershed, Missouri.
- 2010 - MS. Secondary Education – Earth Science, Kathi Oetting. Fostering Students' Comprehension of Sinkholes.
- 2010 – M.S. Secondary Education – Earth Science. Clark Giboney. Effectiveness of “*Explore Geology CD roms*” in the Secondary Classroom.
- 2010 M.S. Geospatial Science. Lea Nondorf, Geochemical Modeling of the Lamotte Sandstone for Carbon Sequestration Purposes, SW Missouri.

### **UNDERGRADUATE INDEPENDENT RESEARCH PROJECTS (PAST 2 YEARS)**

2017 Emery G. Metal availability in sediments from the Joplin MO area,  
2015 Strickland M. Metal mobility in sediments contaminated by mining wastes.  
2015 Jensen P. Groundwater characterization in the area of Aurora MO  
2015 Jones, A. Sediment samples processing for metal analysis determination  
2015 Rodriguez J. Effects of pH, grain size and OM in Pb and Zn content of sediments  
2015 Bybee A. Spatial distribution of Pb and Zn in sediments of a historic mining town

### **SELECTED PEER-REVIEWED PUBLICATIONS (MSU students underlined)**

- Reyes VM, Gutiérrez M, Nuñez D, Alarcon-Herrera MT, 2017. Groundwater quality impacted by land use/land cover change in a semiarid region of Mexico. *Groundwater for Sustainable Development*, 5, 160-167.
- Gutiérrez M, Wu S, Rodriguez J Jones AD Lockwood B. 2016. Assessing the state of contamination for a historic mining town using sediment chemistry. *Arch Environ Contam Toxicol*, 70, 747–756.
- Johnson A, Gutiérrez M, Gouzie D, McAlilly R, 2016. State of remediation and metal toxicity in the Tri-State Mining District, USA. *Chemosphere* 144:1132-1141.
- Gutiérrez M, Wu S, Peebles J. Assessment of mine-contaminated sediments in southwest Missouri, *J. of Soils and Sediments*, 15, 189-197.
- Reyes VM, Alarcon-Herrera MT, Gutiérrez M., Nuñez, D. Arsenic and fluoride in groundwater of an endorheic basin undergoing land use changes. *Archives of Environmental Contamination and Toxicology*, *Arch Environ Contam Toxicol* 68, 292-304.
- Gutiérrez, M, Rubio-Arias H, 2014. Rainwater Harvesting in the State of Chihuahua: A sustainable alternative. *Tecnociencia Chihuahua*, 8(1), 1-6.
- Gutiérrez M, Carreon-Enriquez E. 2014. Amenazas al ecosistema: cambio de uso de suelo y calidad del agua, Ecosistemas acuáticos, In: *La Biodiversidad en Chihuahua: Estudio de Estado*, Consejo Nacional para la Diversidad (CONABIO), México, 526-530.
- Gutiérrez, M., and E. Johnson. 2014. Salinity trend in the Lower Rio Conchos, Chihuahua. In: C.A. Hoyt & J. Karges (editors). *Proceedings of the Sixth Symposium on the Natural Resources of the Chihuahuan Desert Region*. Chihuahuan Desert Research Institute, Fort Davis, TX. pp. 60–70. <http://cdri.org/publications/proceedings-of-the-symposium-on-the-natural-resources-of-the-chihuahuan-desert-region/>
- Alarcón-Herrera MT, Bundschuh J, Nath B, Nicolli HB, Gutierrez M, Reyes-Gomez VM, Nuñez D, Martín-Dominguez IR, Sracek O, 2013. Co-occurrence of arsenic and fluoride in groundwater of semi-arid regions in Latin America: Genesis, mobility and remediation. *Journal of Hazardous Materials*. 262, 960-969.
- Rono N, Biagioni R, Rovey II C., and Gutiérrez M, 2013. Geochemical sequestration reactions within the Lamotte Sandstone at five different locations in Missouri. *Environmental Geosciences*, 20, 97-108

- Reyes-Gomez V.M., Alarcón-Herrera M.T., Gutierrez M. and Nuñez D., 2013. Fluoride and Arsenic in an Alluvial Aquifer System in Chihuahua, Mexico: Contaminant Levels, Potential Sources and Co-occurrence. *Water, Air, & Soil Pollution*.224:1433.
- Gutierrez, M. and Baker, B. 2013. Making Connections to Real Data and Peer-Reviewed Literature: A Short Soil Exercise in a Geochemistry Class. *Journal of Geoscience Education*, 61, 53-58.
- Gutierrez, M., V Reyes, MT Alarcon-Herrera, Daniel Nuñez, 2012. Exploratory analysis of sediment geochemistry to determine the source and dispersion of Ba, Fe, Mn, Pb and Cu and in Chihuahua, northern Mexico, *Journal of Geography and Geology*, 4(4) 26-39.
- Nondorf, L., M. Gutierrez, and T. Plymate, 2011. Modeling carbon sequestration geochemical reactions for a proposed site in Springfield Missouri, *Journal of Environmental Geoscience*, 18, 91-99
- Camacho, L.M., M. Gutierrez, MT Alarcon-Herrera, ML Villalba and S. Deng, 2011 Occurrence and treatment of arsenic in groundwater and soil in Northern Mexico and Southwestern USA. *Chemosphere*, 83, 211-225.
- Gutierrez, M, and E. Johnson, 2010. Temporal variations of natural soil salinity in an arid environment using satellite images, *J. of South American Earth Sciences*, 30, 46-57.
- Gutiérrez, M, S. Johnson. 2009. Why save a can? *Science Activities*, 46, 7-11.
- Gutiérrez, M., M.T. Alarcon-Herrera, L. Camacho, 2009. Geographical distribution of arsenic in sediments within the Rio Conchos Basin, Mexico. *Environmental Geology*, 57, 929-935.
- Gutiérrez, M., C. Martinez-Pina, J. Luo, and K. Mickus, 2008. Geochemical processes contributing to the contamination of soil and surface waters in the Rio Conchos Basin, Mexico. *Geosphere*, 4, 600-611.
- Cornell, J., M. Gutiérrez, A. Wait, H.O. Rubio, 2008. Ecological characterization of a riparian corridor along the Rio Conchos, Mexico. *The Southwest Naturalist*, 53, 96-100.

## **OTHER PUBLICATIONS**

- Gutiérrez, M. 2016. Contenido de metales en sedimentos: una herramienta para evaluar pasivos ambientales mineros. *Tecnociencia Chihuahua*.
- Gutiérrez M. El temible Arsénico. *Revista Pacana* Mar 2016, 2(1) 2pp.
- Gutiérrez M, V Reyes-Gomez 2015 Cuencas Cerradas del Norte. *Revista Pacana*, Mexico
- Gutiérrez, M. NO al abatimiento de mantos freáticos. *Revista Pacana*, Mexico,
- Gutiérrez M. El agua como recurso natural, In *Agua Asolada*, 2016 Gobierno del Estado de Chihuahua, ISBN 978-607-8404-06-3.

## **RECENT RESEARCH GRANTS**

- 2015 Mapping Metal contamination in Aurora, Missouri. MSU Faculty Research Grant.
- 2011 Geochemical spatial analysis to identify distribution and sources of contaminants. MSU Faculty Research Grant.

- 2008 Recruitment outreach initiative using alumni interview videos, President's Fund for Student Engagement and Recruitment, MSU.
- 2008 Gutierrez M, and others, Springfield City Utilities - Carbon sequestration feasibility study. City Utilities of Springfield, MO (sub-contracted to USDOE)
- 2008 Gutierrez M and ML Bowe. Assessing habitat quality from density and genetics of dominant tree species growing along the Rio Conchos in northern Mexico, Latin American, Caribbean and Hispanic Studies at MSU.

### **AWARDS (PAST 5 YEARS)**

- 2013 CNAS (College of Natural and Applied Science) Research Award
- 2014 Invited keynote speaker for *Dia del Nogalero* Conference of the National Pecan Growers Association, Mexico.
- 2015 Invited keynote speaker for 50<sup>th</sup> Anniversary of the Farmers' Union *Union de Credito de Delicias A.C.* Delicias, Mexico.

### **SERVICE (PAST 5 YEARS)**

- Reviewer for research papers to a variety of international journals, e.g., Exploration Geochemistry, Environmental Monitoring and Assessment, and Geological Society of America Special Papers, about 8 reviews per year
- Reviewer for research papers to several Mexican journals, e.g. *Tecnociencia*, *Ecosistemas y Recursos Agropecuarios*, 2-3 reviews per year.
- Member of MSU Multicultural Leadership Scholarship Interviewing Group,
- Department Committees: Search committee for geology faculty hires, Geology curriculum, Faculty performance evaluation committee, Faculty Tenure and Promotion Committee.

### **PROFESSIONAL AFFILIATIONS**

- National Association of Geoscience Teachers  
International Geochemical Association  
American Geophysical Union