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RESEARCH INTERESTS

Surface water-groundwater interactions at various spatial scales using field methods and modeling. Multiphysics transport phenomena. Heterogeneity and architecture of fluvial deposits. Applications of environmental and artificial tracers.

EDUCATION

Ph.D., 2006 Earth and Environmental Science (Hydrology), New Mexico Inst. Of Mining and Technol.
M.S., 2002 Geology (Hydrogeology), University of Nebraska-Lincoln
B.S., 1999 Geology, University of the Philippines-Diliman

PROFESSIONAL EXPERIENCE

Assistant Professor, The University of Texas at Austin, 2006-present
Research Assistant, NM Bureau of Geology and Mineral Resources, 2002-2006
Teaching Assistant, NM Inst. Of Mining and Technol., Spring 2005, Fall and Spring 2004
Teaching and Laboratory Assistant, University of Nebraska-Lincoln, 1999-2002

SELECTED HONORS

2006, Plenary Speaker for the 2nd Gordon Research Conference on Permeable Sediments
2005, American Geophysical Union Horton (Hydrology) Research Grant
2005, New Mexico Water Resources Research Institute Student Grant
2004, American Geophysical Union Outstanding Student Paper Award (Hydrology Section)
2003, CH2M-Hill Outstanding Hydrology Teaching Assistant (New Mexico Tech)
2002-2006 Frank M. Kottowski Fellowship (New Mexico Tech)
2002, Sigma Gamma Epsilon National Honor Society for the Earth Sciences
2001, American Association of Petroleum Geologists Paul Danheim Nelson Award
2001, Nebraska Geological Society Yatkola-Edwards Research Grant
2000 and 2001, University of Nebraska-Lincoln Department of Geosciences Summer Fellowship
1999, Arthur Saldivar-Sali Award (Best Senior Thesis in Geology, University of the Philippines)
1999, Outstanding BS Geology Graduate (University of the Philippines)
1996-1999, Dean's List (University of the Philippines)

PUBLICATIONS

Peer-reviewed:

- Cardenas, M. B., Potential contribution of topography-driven regional groundwater flow to fractal stream chemistry: residence time distribution analysis of Toth flow, *Geophysical Research Letters*, submitted.
- Cardenas, M. B., J. W. Harvey, A. I. Packman, and D. T. Scott, Ground-based thermography of fluvial systems at low and high discharge reveals complex thermal heterogeneity driven by flow variation and bioroughness, *Limnology and Oceanography: Methods*, submitted.
- Cardenas, M. B., and J. L. Wilson, Exchange across a sediment-water interface with ambient groundwater discharge, *Journal of Hydrology*, submitted.
- Cardenas, M. B., and J. L. Wilson, Dunes, turbulent eddies, and interfacial exchange with permeable sediments, *Water Resources Research*, submitted.
- Cardenas, M. B., and J. L. Wilson, The effects of current-bedform induced fluid flow on the thermal regime of sediments, *Water Resources Research*, accepted pending revisions.
- Cardenas, M. B., and J. L. Wilson, Hydrodynamics of coupled flow above and below a sediment-water interface with triangular bed forms: underflow case, *Advances in Water Resources*, in press.
- Cardenas, M. B., and J. L. Wilson, Hydrodynamics of coupled flow above and below a sediment-water interface with triangular bed forms and ambient groundwater discharge, *Journal of Hydrology*, 331, doi:10.1016/j.jhydrol.2006.05.012, 103-109, 2006.
- Cardenas, M. Bayani, and J. L. Wilson, Comment on "Flow resistance and bed form geometry in a wide alluvial channel" by Shu-Qing Yang, Soon-Keat Tan and Siow-Ying Lim, *Water Resources Research*, 42, W06601, doi:10.1029/2005WR004663, 2006.

- Cardenas, M. B., J. L. Wilson, and V. A. Zlotnik, Impacts of heterogeneity, bed forms, and stream curvature on subchannel hyporheic exchange, *Water Resources Research*, 40, W08307, doi: 10.1029/2004WR003008, 2004.
- Cardenas, M. B., and V. A. Zlotnik, Three-dimensional model of modern channel bend deposits, *Water Resources Research*, 39(6), 1441, doi:10.1029/2002WR001383, 2003.
- Cardenas, M. B., and V. A. Zlotnik, A simple constant-head injection test for streambed hydraulic conductivity estimation, *Ground Water*, 41(6), 867-871, 2003.

Under preparation:

- Cardenas, M. B., and J. L. Wilson, The thermal regime of sediments in channels under gaining and losing conditions.
- Cardenas, M. B., J. L. Wilson, and R. Haggerty, Current-bedform induced fluid and mass transport through dunes results in power-law residence time distributions.
- Cardenas, M. B., and J. L. Wilson, The relationship between the shape and drag of triangular bedforms: a numerical simulation study.
- Cardenas, M. B., and M. N. Gooseff, Comparison of hyporheic flow under ice-free and ice-covered channels based on linked surface-ground-water simulations.
- Cardenas, M. B., P. Cook, H. Jiang, P. Traykovski, Fluid flow and nitrogen transport through symmetric sand ripples under oscillatory flow.

Conference presentations/ Abstracts:

- M. B. Cardenas, and J. L. Wilson, Multiphysics modeling of processes along sediment-water interfaces: towards fundamental understanding and mechanistic predictions, Supplement to EOS Transactions, American Geophysical Union, 2005 AGU Fall Meeting, San Francisco, California, December, 2006.
- M. B. Cardenas, and J. L. Wilson, The relationship between shape and drag of triangular bedforms: a numerical simulation study, Supplement to EOS Transactions, American Geophysical Union, 2005 AGU Fall Meeting, San Francisco, California, December, 2006.
- M. B. Cardenas, Flumes, finite-elements, field observatios, Fourier-series and fractals: fundamental linkages in hyporheic zone research, GSA Abstracts with Programs, Philadelphia, October, 2005.
- J. L. Wilson, and M. B. Cardenas, Streamflow, turbulent eddies, interfacial exchange and heat transport in the hyporheic zone, New Mexico Water Research Symposium, Socorro, NM, August, 2006.
- L. A. Mendez-Barroso, et al., Spatial and temporal analysis of hydrometeorological conditions in the Valles Caldera, New Mexico during the North American Monsoon, Supplement to EOS Transactions, American Geophysical Union, 2005 AGU Fall Meeting, San Francisco, California, December, 2005.
- M. B. Cardenas, and J. L. Wilson, Heat transport near sediment-water interfaces with bedforms, Supplement to EOS Transactions, American Geophysical Union, 2005 AGU Fall Meeting, San Francisco, California, December, 2005.
- J. L. Wilson, and M. B. Cardenas, Multiphysics modeling of strongly coupled hydrologic phenomena, GSA Abstracts with Programs, Salt Lake City, October, 2005.
- Cardenas, M. B., and J. L. Wilson, Flow dynamics near an irregular sediment-water interface under ambient groundwater discharge, GSA Abstracts with Programs, Salt Lake City, October, 2005.
- Rinehart, A., et al., Design and implementation of a hydrometeorological field campaign in the Valles Caldera, New Mexico, New Mexico Water Research Symposium, Socorro, NM, August, 2005.
- Cardenas, M. B., and J. L. Wilson, Water flow above and below a sediment-water interface under ambient groundwater discharge, in American Society of Limnology and Oceanography Aquatic Sciences Meeting Conference Proceedings, Salt Lake City, February, 2005.
- Cardenas, M. B., and J. L. Wilson, Hydrodynamic interactions of free-flowing fluids and pore-fluids in triangular bed forms, Supplement to EOS Transactions, American Geophysical Union, 2004 AGU Fall Meeting, San Francisco, California, December, 2004.
- Cardenas, M. B., and J. L. Wilson, Coupled modeling of river-hyporheic zone fluid flow with explicit bed forms, New Mexico Water Research Symposium, Socorro, NM, August, 2004.
- Cardenas, M. B., Three-dimensional modeling of hyporheic flow through heterogeneous sediments, GSA Abstracts with Programs, Seattle, Washington, November, 2003.
- Cardenas, M. B., and V. A. Zlotnik, Assessment of bend bed topography models via calibration to a ground-penetrating radar profile and permeability data, Supplement to EOS Transactions, American Geophysical Union, 2002 AGU Fall Meeting, San Francisco, California, December, 2002.
- Zlotnik, V. A., S. J. Kollet, M. B. Cardenas, and D. Woodward, Study of stream-aquifer interactions in the Platte River Watershed using methods of aquifer hydraulics, sedimentology, geophysics and geostatistics, *GSA Abstracts with Programs*, Denver, Colorado, October, 2002.
- Cardenas, M. B., Three-dimensional characterization of the permeability field of heterogeneous modern streambed deposits, *AAPG Bull.*, 85(11), p. 2047, 2001.
- Cardenas, M. B., and V. A. Zlotnik, Hydrogeological Model of Active Meander Deposits Based on Three-dimensional Hydraulic Characterization, in *Fluvial Sedimentology 2001: 7th International Conference on Fluvial*

Sedimentology Program and Abstracts, edited by J. A. Mason, R. F. Diffendal, Jr., and R. M. Joeckel, p.148, Open-File Report 60, CSD, University of Nebraska-Lincoln, Nebraska, 2001.
Cardenas, M. B., and V. A. Zlotnik, Mapping modern heterogeneous streambed deposits through hydraulic testing, *GSA Abstracts with Programs*, Reno, Nevada, p. A360, 2000.

PROFESSIONAL ACTIVITIES

Manuscript reviewer: *Advances in Water Resources*, *ASCE Journal of Hydrologic Engineering*, *Biogeosciences*, *Environmental Science and Technology*, *Ground Water*, *Hydrogeology Journal*, *Journal of Hydrology*, and *Water Resources Research*

2007 Invited Speaker, University of Nevada-Reno, Graduate Program of Hydrologic Sciences

2006 Invited Speaker, American Geophysical Union Fall Meeting

2006 Invited Speaker, Geological Society of America Annual Conference

2006 Session Chair, Geological Society of America Annual Conference

2006 Invited Speaker, University of Texas at Austin, Dept. of Geological Sciences

2006 Invited Speaker, University of Virginia, Dept. of Envl. Sciences

2006 Invited Speaker, Georgia State University, Dept. of Geosciences

2006 Invited Speaker, University of Wyoming, Dept. of Geology and Geophysics

2006 Invited Speaker, University of Pittsburgh, Dept. of Geology and Planetary Science

2005 2004 NMT Graduate Student Association Travel Grant Review Committee

2005 NMT Graduate Student Association Spring Conference Abstract Review Committee