

## **Meredith D. Reitz**

Division of Marine Geology and Geophysics  
Lamont-Doherty Earth Observatory, Columbia University  
mreitz@ldeo.columbia.edu

61 Route 9W  
Palisades, NY 10964  
(215) 380-4693

## **Education**

University of Pennsylvania, Philadelphia, Pennsylvania

Ph.D., Physics, Department of Physics and Astronomy

Graduation: May, 2012

Thesis: Landscape-scale patterns resulting from thresholds, memory, and diffusion

Dissertation supervisor: Douglas J. Jerolmack

Barrett Honors College, Arizona State University, Tempe, Arizona

B.S., Physics (Magna Cum Laude), minoring in Math, Astronomy, English, and Political Science

Graduation: May, 2007

Thesis: Carbon dioxide sequestration: general, and specific to chrysotile

## **Employment**

08/14 – 07/16 Mendenhall Fellow, U.S. Geological Survey, Reston, VA

08/12 – 07/14 Postdoctoral Fellow, Lamont-Doherty Earth Observatory, Columbia University, Palisades, NY

Current research:

- Interaction between tectonics and river channel movement, and application to Bangladesh, using theory and field-derived subsidence data
- Determining controls on landslide runout and erosion by combining enhanced-g centrifuge experiments with theory and model development

06/12 – 07/12 Postdoctoral scientist, University of Pennsylvania, Philadelphia, PA

08/07 – 05/12 Research/Teaching Assistant, University of Pennsylvania, Philadelphia, PA

05/06 – 08/06 Research Assistant, Triangle Universities Nuclear Laboratory, Duke University, Durham, NC

## **Grants and awards**

Co-PI on funded National Science Foundation grant, “Hazards SEES Type 1: Predicting Landslide Runout and Granular Flow Hazard: Enhanced-g Centrifuge Experiments, Contact Dynamics Model Development and Theoretical Study” (total award amount: \$299,880)

Postdoctoral Fellowship, Lamont-Doherty Earth Observatory, Columbia University (\$58,000 / yr)

Dissertation Research Fellowship, AY 2010-2011 (\$9,000)

Benjamin Franklin Fellowships, 2010-2011 and 2007-2008

UPenn School of Arts and Sciences and UPenn Graduate and Professional Student Assembly conference travel grants, 2009, 2010, 2011 (\$2,200 total)

CZEN grant to visit and research at the Institut de Physique du Globe de Paris, Fall 2010 (\$9,500)  
Project: Spatiotemporal evolution of experimental braided rivers  
Supervisor: E. Lajeunesse  
First place student talk award, Art of Research Graduate Symposium, UPenn, March 2010 (\$500)  
First place student poster award, Binghamton Geomorphology Symposium, October 2009 (\$100)  
National Merit Scholarship, 4-year tuition waiver and stipend, Arizona State, 2002-2007 (~\$70,000)

## **Additional activities and service**

Session co-convener, Advances in understanding fluvial-deltaic processes, and their interactions with the tectonic setting, 2014 American Geophysical Union annual meeting  
Organizer of Marine Geology and Geophysics divisional seminar at Lamont-Doherty Earth Observatory, Fall 2013 – Spring 2014  
Session co-convener, From grains to landscapes: geophysical flows, sediment transport and associated morphologies, 2014 European Geosciences Union annual meeting  
Lead session convener, EP23, The Physics of Granular and Turbulent Flows in Geomorphology, 2011 American Geophysical Union annual meeting  
Reviewer, *Journal of Sedimentary Research*; *Journal of Geophysical Research – Earth Surface*; *Geophysical Research Letters*; *Water Resources Research*  
Judge, Art of Research Graduate Symposium, UPenn, 2011  
Attended National Center for Earth-Surface Dynamics Summer Institute, Minneapolis, MN, 2011  
Member of American Geophysical Union  
Member of American Physical Society  
Member of Phi Beta Kappa  
Member of Sigma Xi

## **Publications**

Litwin, K.L., **M.D. Reitz**, and D.J. Jerolmack (2014), Quantifying grain size and shape changes in alluvial fan sediments, *In preparation*.

**Reitz, M.D.**, J.L. Pickering, S.L. Goodbred Jr., C. Paola, M. Steckler, L. Seeber, and S.H. Akhter (2014). Effects of tectonic deformation and sea level on river path selection: theory and application to the Ganges-Brahmaputra-Meghna River Delta, *Submitted to JGR – Earth Surface*.

**Reitz, M.D.**, D.J. Jerolmack, E. Lajeunesse, A. Limare, O. Devauchelle, and F. Métivier (2014), Diffusive evolution of experimental braided rivers, *Physical Review E* **89**, 052809.

Pickering, J.L., S.L. Goodbred, **M.D. Reitz**, T.R. Hartzog, D.R. Mondal, and M.S. Hossain (2013), Late Quaternary sedimentary record and Holocene channel avulsions of the Jamuna and Old Brahmaputra River Valleys in the Upper Bengal Delta Plain, *Geomorphology*, *In Press*.

**Reitz, M. D.** (2012). "Landscape-scale patterns resulting from thresholds, memory, and diffusion" (Doctoral dissertation). *Dissertation available from ProQuest*. Paper AAI3509398.

- Jerolmack, D.J., R.C. Ewing, F. Falcini, R.L. Martin, C. Masteller, C. Phillips, **M.D. Reitz**, and I. Buynevich (2012), Internal boundary layer model for the evolution of desert dune fields, *Nature Geosci.*, 5, 206–209, doi:10.1038/NCEO1381.
- Reitz, M.D.**, and D.J. Jerolmack (2012), Experimental alluvial fan evolution: channel dynamics, slope controls and shoreline growth. *J. Geophys. Res.– Earth Surf.* **117**, F02021.
- Limare, A., M. Tal, **M.D. Reitz**, E. Lajeunesse, and F. Métivier (2011), Optical method for measuring bed topography and flow depth in an experimental flume, *Solid Earth* **2**, 143-154, doi:10.5194/se-2-143-2011.
- Jerolmack, D.J., **M.D. Reitz**, and R.L. Martin (2011), Sorting out abrasion in a gypsum dune field, *J. Geophys. Res.* **116**, F02003, doi:10.1029/2010JF001821.
- Reitz, M.D.**, D.J. Jerolmack, R.L. Martin, and R.C. Ewing (2010), Barchan-parabolic dune pattern transition from vegetation stability threshold, *Geophysical Research Letters* **37**, doi: 10.1029/2010GL044957.
- Reitz, M.D.**, D.J. Jerolmack, and J.B. Swenson (2010), Flooding and flow path selection on alluvial fans and deltas, *Geophysical Research Letters* **37**, doi: 10.1029/2009GL041985.

## Presented research

- Reitz, M.D., C. Stark, C.-Y. Hung, B. Smith, E. Grinspun, H. Capart, L. Li, L. Hsu, T. Crone, H. Ling (2014, April). Connecting grain-scale physics to macroscopic granular flow behavior using discrete contact-dynamics simulations, centrifuge experiments, and continuum modeling. Poster presented at European Geosciences Union annual conference, Vienna, Austria.
- Reitz, M.D., M. Steckler, C. Paola, S. Goodbred Jr., A. Petter, J. Pickering, and L. Williams (2013, December). River avulsions in the presence of tectonic tilting, and the Ganges-Brahmaputra Delta. Talk presented at American Geophysical Union annual conference, San Francisco, CA.
- C. Wilson, S.L. Goodbred, L.W. Auerbach, K.R. Ahmed, C. Paola, M.D. Reitz, and J. Pickering (2013, December). Geomorphology and Landscape Evolution Model for the natural and human-impacted regions of the Ganges-Brahmaputra-Meghna Delta. Poster presented by Wilson at American Geophysical Union annual conference, San Francisco, CA.
- Sincavage, R., S.L. Goodbred, L.A. Williams, J. Pickering, C. Wilson, M.S. Steckler, L. Seeber, M.D. Reitz, S. Hossain, S.H. Akhter, D.R. Mondal, and C. Paola (2013, December). A comprehensive view of Late Quaternary fluvial sediments and stratal architecture in a tectonically active basin: Influence of eustasy, climate, and tectonics on the Bengal Basin and Brahmaputra River system. Poster presented by Sincavage at American Geophysical Union annual conference, San Francisco, CA.
- Hung, C.-Y., H. Capart, T.J. Crone, E. Grinspum, L. Hsu, D. Kaufman, L. Li, H.I. Ling, M.D. Reitz, B. Smith, and C.P. Stark (2013, December). Scaling up debris-flow experiments on a centrifuge. Poster presented by Hung at American Geophysical Union annual conference, San Francisco, CA.

Steckler, M.S., S. L. Goodbred, S. H. Akhter, L. Seeber, M.D. Reitz, C. Paola, S.L. Nooner, S. DeWolf, E.K. Ferguson, J. Gale, S. Hossain, M. Howe, W. Kim, C.M. McHugh, D.R. Mondal, A.L. Petter, J. Pickering, R. Sincavage, L.A. Williams, C. Wilson, and M.A. Zumberge (2013, December). Ganges-Brahmaputra Delta: Balance of Subsidence, Sea level and Sedimentation in a Tectonically-Active Delta. Talk presented by Steckler at American Geophysical Union annual conference, San Francisco, CA.

Reitz, M.D., A. Petter, J. Pickering, C. Paola, M. Steckler, and S. Goodbred (2013, September). River avulsions in the presence of tectonic tilting. Talk presented at Lamont-Doherty Earth Observatory Postdoctoral Symposium, Palisades, NY.

Reitz, M.D., A. Petter, J. Pickering, C. Paola, M. Steckler, and S. Goodbred (2013, May). River avulsions, tectonic tilting, and the Ganges-Brahmaputra delta. Talk presented at Soil to Sea Geomorphology meeting, Baltimore, MD.

Reitz, M.D. (2013, April). River avulsions and tectonic tilting: Application of theory from experiments to the Ganges-Brahmaputra delta. Talk presented at Marine Geology and Geophysics seminar at Lamont-Doherty Earth Observatory, Palisades, NY.

Reitz, M.D., D.J. Jerolmack, E. Lajeunesse, A. Limare, O. Devauchelle, and F. Métivier (2013, March). Diffusive evolution of experimental river channel networks. Talk presented at American Physical Society March Meeting, Baltimore, MD.

Reitz, M.D., E. Lajeunesse, D.J. Jerolmack, A. Limare, O. Devauchelle, and F. Métivier (2012, December). Diffusive evolution of experimental braided rivers. Poster presented at American Geophysical Union annual conference, San Francisco, CA.

Jerolmack, D.J., R.C. Ewing, F. Falcini, R.L. Martin, C. Masteller, C.B. Phillips, and M.D. Reitz (2012, December). Feedbacks between roughness and boundary-layer aerodynamics control desert dune field evolution. Talk presented by Jerolmack at American Geophysical Union annual conference, San Francisco, CA.

Ewing, R.C., D.J. Jerolmack, R.L. Martin, M.D. Reitz, C.B. Phillips, F. Falcini, and C. Masteller (2012, December). Morphology and formation of the upwind margin at White Sands Dune Field. Talk presented by Ewing at American Geophysical Union annual conference, San Francisco, CA.

Reitz, M.D., E. Lajeunesse, D.J. Jerolmack, A. Limare, O. Devauchelle, and F. Métivier (2012, May). Diffusive evolution of experimental braided rivers. Talk presented at Soil to Sea Geomorphology meeting, Philadelphia, PA.

Reitz, M.D., and D.J. Jerolmack (2012, March). An analytical framework for aeolian saltation. Talk presented at American Physical Society March Meeting, Boston, MA.

Reitz, M.D., E. Lajeunesse, A. Limare, O. Devauchelle, F. Metivier, and D.J. Jerolmack (2011, December). Quantifying temporal and spatial scales and patterns in experiments. Talk presented at American Geophysical Union annual conference, San Francisco, CA. (*Invited*)

Reitz, M.D., and D.J. Jerolmack (2011, December). An analytical framework for aeolian saltation. Poster presented at American Geophysical Union annual conference, San Francisco, CA.

D.J. Jerolmack, R.C. Ewing, F. Falcini, R.L. Martin, C. Masteller, C.B. Phillips, M.D. Reitz (2011, December). Roughness controls patterns of sediment transport, vegetation and groundwater in a desert dune field. Talk presented by Jerolmack at American Geophysical Union annual conference, San Francisco, CA.

D.J. Jerolmack, M.D. Reitz, R.L. Martin (2011, December). Sorting out abrasion in a gypsum dune field. Talk presented by Jerolmack at American Geophysical Union annual conference, San Francisco, CA.

Reitz, M.D., and D.J. Jerolmack (2011, March). Thresholds, memory and self-similarity on river deltas. Talk presented at American Physical Society annual conference, Dallas, TX.

Reitz, M.D., D.J. Jerolmack, R. Martin, R. Ewing, and D. Bustos (2010, December). Predicting the effect of changing vegetation conditions on aeolian dune landscapes. Talk presented at American Geophysical Union annual conference, San Francisco, CA.

Jerolmack, D.J., and M.D. Reitz (2010, December). Growth of river delta networks: Thresholds, periodicity, aging and self similarity. Talk presented by Jerolmack at American Geophysical Union annual conference, San Francisco, CA.

Jerolmack, D.J., R.L. Martin, C. Paola, M.D. Reitz, and R. Schumer (2010, December). Linking stochastic sediment transport to physical processes. Talk presented by Jerolmack at American Geophysical Union annual conference, San Francisco, CA.

Reitz, M.D., and D.J. Jerolmack (2010, September). Thresholds, memory, and self-similarity: building sediment dispersal systems. Talk presented at Geological Society of London William Smith Meeting, London, England.

Jerolmack, D.J., and M.D. Reitz (2010, April). Flooding, flow path selection and growth of alluvial fans and deltas. Talk presented by Jerolmack at European Geoscience Union annual conference.

Reitz, M.D. (2010, March). Self-organization and evolution of a river delta. Talk presented at University of Pennsylvania Art of Research Graduate Symposium, Philadelphia, PA.

Reitz, M.D., and D.J. Jerolmack (2009, December). Modeling dynamics of channel reoccupation on alluvial fans. Poster presented at American Geophysical Union annual conference, San Francisco, CA.

Reitz, M.D., D.J. Jerolmack, Martin, R., Ewing, and D. Bustos (2009, October). Competing effects of sediment flux and vegetation on dune morphology. Poster presented at the annual Binghamton Geomorphology Symposium, Blacksburg, VA.

Reitz, M.D., D.J. Jerolmack, and E. Moberg (2008, December). Channel dynamics of experimental alluvial fans with a bimodal grain size distribution. Poster presented at American Geophysical Union annual conference, San Francisco, CA.