Luke McGuire

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University of Arizona
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Education

University of Arizona, Tucson, AZ (*August 2008-May 2013*)
- PhD, Applied Mathematics (*May 2013*)
- MS, Applied Mathematics (*December 2009*)

Bucknell University, Lewisburg, PA (*June 2004-May 2008*)
- BS, Mathematics, Magna Cum Laude (*May 2008*)

Research Experience

- Postdoctoral Researcher, Department of Geosciences, University of Arizona (*June 2013-present*)
- Research Assistant, Department of Geosciences, University of Arizona (*Jan 2010-May 2010, August 2011-August 2012, Jan 2013-May 2013*)
- Summer Intern, Lawrence Livermore National Laboratory, Atmospheric, Earth, and Energy Division, Livermore, CA (*June 2010-August 2010*)

Teaching Experience

- Instructor, Math 122B: Calculus I, University of Arizona, Tucson, AZ (*August 2012-Dec 2012*)
- Project Mentor, Math 485 (Mathematical Modeling), University of Arizona (*Jan 2011-May 2011, Jan 2012-May 2012*)
  - Advised a group of students for a one semester research project
- Instructor, Math 112: College Algebra, University of Arizona, Tucson, AZ (*August 2009-Dec 2009, August 2010-Dec 2010*)

Honors/Awards

- University of Arizona: VIGRE Research Fellowship (*Spring 2011*)
- University of Arizona: S-STEM Fellowship (*August 2008-August 2009*)
- Phi Beta Kappa Honor Society (*Spring 2008-present*)

Conferences Attended

- American Geophysical Union (AGU) Annual Meeting, San Francisco, CA, poster presentation (*December 2013*)
- American Geophysical Union (AGU) Annual Meeting, San Francisco, CA, poster presentation (*December 2012*)
- AGU Chapman Conference on Source to Sink Systems Around the World and Through Time, Oxnard, CA, poster presentation (*January 2011*)

Presentations

- The influence of slope aspect on the evolution of cinder cones in the San Francisco volcanic field, Arizona. University of Arizona Applied Mathematics Brown Bag Seminar (*September 2012*)
- Relationships between debris fan morphology and flow rheology for wet and dry flows on Earth and Mars. Stochastic Transport and Emergent Scaling in Earth-surface Processes Workshop. Glenbrook, NV. (*November 2011*)
- Controls on the formation and geometry of rill networks. University of Arizona Modeling, Computation, Nonlinearity, Randomness, and Waves Seminar (*October 2011*)

- Modeling multiphase flows and debris fan development. University of Arizona Applied Mathematics Brown Bag Seminar (*September 2011*)
- The formation of channels. University of Arizona Applied Mathematics Brown Bag Seminar (*February 2011*)
- Modeling hillslope evolution. University of Arizona Applied Mathematics Brown Bag Seminar (*April 2010*)

Service Activities/ Professional Organizations

- Tucson Math Circle (middle school/high school outreach) (*Fall 2013-present*)
- American Geophysical Union (AGU), Member (*2011-present*)
- University of Arizona SIAM chapter, Treasurer (*Summer 2010-Summer 2011*)
- Society for Industrial and Applied Mathematics (SIAM), Member (*2007-present*)

Computer Skills

- C, MATLAB, IDL
- Familiar with Unix/Linux

Dissertation

- Modeling the evolution of rill networks, debris fans, and cinder cones: connections between sediment transport processes and landscape development
- Advisor: Jon Pelletier

Publications

- McGuire, L. A., and J. D. Pelletier, Relationships between debris fan morphology and flow rheology for wet and dry flows on Earth and Mars: A numerical modeling investigation, *Geomorphology*, 197, 2013.
- McGuire, L. A., J. D. Pelletier, J. A. Gomez, and M. A. Nearing, Controls on the spacing and geometry of rill networks on hillslopes: Rain splash detachment, initial hillslope roughness, and the competition between fluvial and colluvial transport, *Journal of Geophysical Research*, doi:10.1002/jgrf.20028, 2013.
- Pelletier, J. D., DeLong, S. B., C. Orem, P. Becerra, K. Compton, K. Gressett, J. Lyons-Baral, L. A. McGuire, J. L. Molaro, and J. C. Spinler, How do vegetation bands form in drylands? Insights from numerical modeling and field studies in southern Nevada, U.S.A., *Journal of Geophysical Research*, doi:10.1029/2012JF002465, 2012.
- Pelletier, J. D., L. McGuire, J. Ash, T. M. Engelder, L. Hill, K. Leroy, C. Orem, S. Rosenthal, M. Trees, C. Rasmussen, and J. D. Chorover, Calibration and testing of upland hillslope evolution models in a dated landscape: Banco Bonito, New Mexico, USA, *Journal of Geophysical Research*, doi:10.1029/2011JF001976, 2011.
- Komatsu, G., Goto, K., Baker, V.R., Oguchi, T., Yuichi S. Hayakawa, Y.S., Hitoshi, Saito, H., Jon D. Pelletier, J.D., McGuire, L., and Iijima, Y., 2014, Effects of tsunami wave erosion on natural landscapes: Examples from the 2011 Tohoku-oki Tsunami, in Kontar, Y., Santiago-Fandio, V., and Takahashi, T., editors, Tsunami Events and Lessons Learned; Environmental and Societal Significance. Springer, Heidelberg, p. 243-253.
- McGuire, L. A., J. D. Pelletier, and J. J. Roering, Development of topographic asymmetry on hillslopes: Insights from dated cinder cones in the western United States, *Submitted*.
- Hayakawa, Y.S., T. Oguchi, H. Saito, A. Kobayashi, V.R. Baker, J.D. Pelletier, L.A. McGuire, G. Komatsu, and K. Goto, Geomorphic impacts of repeated tsunami waves in a coastal valley in northeastern Japan, *Submitted*.