

# **Katherine J. Skalak**

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## **Research interests**

Landscape dynamics and fluvial geomorphology, generally focused on understanding and predicting changes in the patterns and functions of landforms in response to human impacts and restoration efforts. In particular, dynamics of fine sediment and particle associated nutrients and contaminants on varying temporal and spatial scales, flow and vegetation effects, and disturbance.

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## **Education**

### **University of Delaware, Newark, DE**

Ph.D. in Geological Sciences, August, 2009.

Dissertation Title: "*Fine-grained channel margin deposits in a typical gravel bed river: Spatial and temporal controls on the distribution, quantity, and residence time and implications for Centennial-scale Sediment and Mercury Cycling.*"

Adviser: Dr. James E. Pizzuto

### **University of Delaware, Newark, DE**

M.S. in Geology, August, 2004.

Thesis Title: "*The effects of dam removal on downstream channel characteristics in Pennsylvania and Maryland: assessing the potential consequences of dam removal.*"

Adviser: Dr. James E. Pizzuto.

### **St. Joseph's University, Philadelphia, PA**

B. S. in Environmental Science, May, 2001.

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## **Research and Work Experience**

**U.S. Geological Survey, National Research Program.** Post-doctoral researcher in the Hydroecology of Flowing Waters Project, National Research Program, 2009 to present.

### **University of Delaware, Department of Geological Sciences.**

Visiting scholar, The Johns Hopkins University, 2006 to 2009.

Research Assistant, January 2005 to June 2006.

Research Assistant, September 2002 to September 2003.

**Environmental Management Group, Media, PA.** Environmental Consultant, 2002.

**Biological Treatment Systems, Bala Cynwyd, PA.** Lab Coordinator, 2001 to 2002.

**Academy of Natural Sciences, Philadelphia, PA.** Research Internship, 2000.

## Teaching and Mentoring Experience

### University of Delaware, Department of Geological Sciences.

Mentor, 2008 to present. Undergraduate research assistants at Johns Hopkins University,

Mentor, 2008. Undergraduate research assistants at University of Delaware.

Fellow, National Science Foundation's GK-12 program, June 2006 to 2008.

Teaching Assistant, 2003 to 2004. Graded assignments, administered labs, assisted with field trips, organized and lead help sessions for the following courses: GEOL 303: Earth Surface Processes, GEOL 113: Earth Science

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## Selected Publications

### Published Research Papers

Skalak, K., and Pizzuto, J. 2010. The distribution and residence time of suspended sediment stored within the channel margins of a gravel-bed bedrock river. *Earth Surface Processes and Landforms*. DOI: 10.1002/esp.1926.

Flanders, J.R., Turner, R.R., Morrison, T., Jensen, R., Pizzuto, J., Skalak, K., and Stahl, R. in review, *Applied Geochemistry*. Behavior, distribution, and transport of inorganic and methyl mercury in a high gradient stream.

Skalak, K., Pizzuto, J., and Hart, D. 2009. Influence of small dams on downstream channel characteristics in Pennsylvania and Maryland: implications for the longterm geomorphic effects of dam removal. *Journal of American Water Resources Association* 5(1): 97-109.

Skalak, K. and Pizzuto, J. in press. The Geomorphic Effects of Existing Dams and Historic Dam Removals in the mid-Atlantic Region, USA. *In Sediment Dynamics Following Dam Removal*. American Society of Civil Engineers (ASCE) monograph.

Skalak, K. and Pizzuto, J. 2005. The Geomorphic Effects of Existing Dams and Historic Dam Removals in the mid-Atlantic Region, USA. *"Managing Watersheds for Human and Natural Impacts: Engineering, Ecological, and Economic Challenges"* EWRI & ASCE, Proceedings.

### Technical Report

Pizzuto, J.E., Skalak, K.J., O'Neal, M., Narinesingh, P., Rhoades, R., and Hess, J. 2006, Geomorphology of the South River between Waynesboro and Port Republic, VA: Geomorphic characterization and sediment budget for silt and clay. Technical Report, 14 chapters.

### Research Papers in preparation

Skalak, K. and Pizzuto, J. Reconstructing historical water quality in a mercury-contaminated gravel-bed river.

Skalak, K., Pizzuto, J., and Hess, J. The spatial and temporal controls on in-channel sediment storage: the role of large, woody debris, channel geometry, and historic land use.

Pizzuto, J., Chen, C., Skalak, K., Narinesingh, P., and Yoo, K. Radionuclide dating of mercury-contaminated fine sediment stored in the hyporheic zone of the gravel-bedded South River, VA.

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### **Published Abstracts**

Skalak, K. and Pizzuto, J. 2009. Modeling a century of pollution in the South River; a geological approach. Geological Society of America *Abstracts with Programs*, Vol. 41, No. 7, p. 80.

Skalak, K., and Pizzuto, J. 2008. The importance of Fine-Grained Channel Margin (FGCM) Deposits in assessing multiple residence times of suspended sediments and contaminants in gravel-bed rivers. *Eos Trans. AGU*, 89(53), Fall Meet. Suppl., Abstract H51J-04.

Skalak, K. and Pizzuto, J. 2008. The Distribution, Residence Time, and Fate of Hg and Sediment in Fine-Grained Channel Margin (FGCM) Deposits within a Steep, Gravel-Bed River. Geological Society of America's Joint Annual Meeting. Abstract 165-4.

Skalak, K., Wilcock, P. and Pizzuto, J. 2007. Trapping of fine-grained sediment in a gravel-bed river by large woody debris: a physical modeling study. *Eos Trans. AGU*, 88(52), Fall Meet. Suppl., Abstract H51E-0811

Skalak, K., Pizzuto, J., Flanders, J.R., Morrison, T., Turner, R., Jensen, R., and Grosso, N., 2007. Conceptual models of particulate and mercury transport and storage for S. River, VA. Geological Society of America *Abstracts with Programs*, Vol. 39, No. 6, p. 249

Skalak, K. and Pizzuto, J. 2006. Fine-grained channel margin (FGCM) deposits conditioned by large, woody debris (LWD) in a gravel-bed river. *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstract H41H-05.

Skalak, K., Pizzuto, J., Narinesingh, P., Rhoades, E. and O'Neal, M., 2006. Application of a sediment budget approach to evaluate sources and sinks of Hg-contaminated sediment in a gravel-bed river, S. River, VA. Geological Society of America *Abstracts with Programs*, Vol. 38, No. 7, p. 55

Skalak, K. and Pizzuto, J. 2004. The Influence of Dams on Streams of the Mid-Atlantic Region, USA: *Eos Trans. AGU*, 85(47), *Fall Meeting Suppl.*

Skalak, K., Pizzuto, J., Jenkins, P. 2004. The effects of dam removal on downstream channel characteristics in Pennsylvania and Maryland: assessing the potential consequences of dam removal. *GSA Northeastern and Southeastern Section Abstracts with Programs*, Joint Spring Meeting Vol. 36, No. 2, March 2004.

Skalak, K., Pizzuto, J., Jenkins, P. 2003. The effects of dam removal on downstream channel characteristics in Pennsylvania and Maryland: assessing the potential consequences of dam removal. *Eos Trans. AGU*, 84(46), *Fall Meeting Suppl.*, Abstract H52A-1168.

Skalak, K., Pizzuto, J., Jenkins, P. 2003. The effects of dam removal on downstream channel characteristics in Pennsylvania and Maryland: assessing the potential consequences of dam removal. *GSA Abstracts with Programs*, National Meeting. November 2003.

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### **Selected Presentations**

K.Skalak, Stotts, S. 2009. On the retreat of forested, cohesive riverbanks, Pizzuto, J., O'Neal, M., and Stotts, S. 40<sup>th</sup> Binghampton Symposium.

INVITED Skalak, K. and Pizzuto, J. November, 2008. The Distribution, Residence Time, and Fate of Hg and Sediment in Fine-Grained Channel Margin (FGCM) Deposits within a Steep, Gravel-Bed River. USGS Technical Seminar, Reston, VA.

INVITED Skalak, K. and Pizzuto, 2008. The fate and transport of mercury and sediment in a gravel-bed river. Fine sediment in the Chesapeake Bay Conference. Annapolis, MD.

INVITED Skalak, K. and Pizzuto, J. 2008. The distribution, residence time, and fate of mercury and sediment in fine-grained channel margin (FGCM) deposits within a steep, gravel-bed river: South River, Virginia. *Society of Environmental Toxicology and Chemistry*. Regional meeting.

Skalak, K. 2008. Lesson study at Howard High School. Presentation for the National Science Foundation's GK-12.

Skalak, K., 2007. University of Delaware's GK-12 project. Presentation for the Department of Geological Sciences 2007 fall seminar series.

Skalak, K., Pizzuto, J., and Narinesingh, P. 2005. Geomorphology of the South River. Presentation to EPA Region III, Wilmington, DE.

Pizzuto, J. E., Egan, J., and Skalak, K.J. 2003. Geomorphic effects of dam removal: summary of current knowledge. Presentation to *ASCE Workshop on Dam Removal*, Johns Hopkins University, Baltimore, MD, August 2003.

Pizzuto, J. E., Egan, J., and Skalak, K.J. 2003. Geomorphic effects of dam removal: summary of current knowledge, presentation to *ASCE Task Committee on Sediment Dynamics Upon Dam Removal*, EWRI Water Congress 2003, Philadelphia, PA.

## **Professional Activities and Service**

Geological Society of America Fall Meeting, session co-chair. 2009.  
Advisory panel for the National Science Foundation, GK-12. 2008 to 2009.  
University Committee Service, Fall 2008.  
Manuscript Reviewer, Journal of American Water Resources Association and Journal of Hydraulic Engineering. 2008-2009.  
Higher Education Teaching Certification (HETC) program, Fall 2008.  
Graduate research seminar, Department of Geological Sciences, 2007 to present.  
Professional Development Workshop for New Castle County Vo-tech Science teachers, November 2007.  
National Science Foundation Annual GK-12 meeting, March 2007 and March 2008.  
Sigma Xi Scientific Research Society seminar and panel discussion, April 2007.  
National Center for Earth Dynamics (NCED) short-course on geomorphology of low-gradient and sand bed streams, Johns Hopkins University, Baltimore, MD.  
American Geophysical Union Fall meeting, session co-chair, Fall 2006.  
Sediment Dynamics Following Dam Removal monograph, Spring 2006.  
NIH and NSF Proposal Writing Workshop, October 2005.  
The Advancement of Women in Geosciences, Spring 2003.

## **Professional Memberships**

Graduate Student Senate, University of Delaware, 2008-2009.  
Geological Society of America, 2002 to present.  
American Geophysical Union, 2002 to present.  
Sigma Xi Scientific Research Society, 2001 to present.  
Delaware chapter of the American Water Resources Association, 2005 to present.  
Society of Women in Environmental Professions (SWEP), 2006.

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## **Honors and Awards**

College of Earth, Ocean, and Atmosphere publication award, 2009.  
Nominated for the Patricia Cross Leadership award, October 2008.  
University of Delaware Dissertation Fellowship, \$22,000. 2008-2009.  
Invited Panelist, NSF GK-12 program, 2009.  
National Science Foundation GK-12 Fellowship, \$60,000. 2006-2008.  
Prosser award, \$1000. 2007  
SWEP Scholarship finalist, 2006.  
Geology Teaching Assistant of the Year, 2004.  
Nominated for University of Delaware university-wide Excellence in Teaching Award, 2003.  
NWWA Scholarship, 2002, \$4000.  
Presidential Scholarship, St. Joseph's University, 1997-2001.