

## ANDREW C. WILCOX

Department of Geosciences

University of Montana

Missoula, MT 59812

Phone: (406) 243-4761

Fax: 406-243-4028

E-mail: [andrew.wilcox@umontana.edu](mailto:andrew.wilcox@umontana.edu)

URL: <http://www.umt.edu/geosciences/faculty/wilcox/index.htm>

---

### EDUCATION

*Ph.D.*, Geosciences, Colorado State University, 2005

*M.S.*, Energy and Resources Group, University of California, Berkeley, 1996

*B.A.*, History, Stanford University, 1992

### APPOINTMENTS

*Assistant Professor*, Department of Geosciences, University of Montana, 2007–present

*National Research Council Post-Doctoral Research Associate*, U.S. Geological Survey,

Geomorphology and Sediment Transport Laboratory, Golden, CO, 2005–2007

Research on interactions among flow regimes, sediment dynamics, and riparian vegetation; effects of floods on native versus non-native seedlings; and quantification of ecological flow requirements in regulated rivers.

*Doctoral Student Researcher*, Colorado State University, 2000–2005

Research on flow hydraulics and channel morphology in steep streams, including stress partitioning among bedforms, woody debris, and bed particles; effects of woody debris on flow resistance; linkages among hydraulics, geomorphic processes and invertebrate drift; and three-dimensional flow structure and turbulence.

*Master's Student Researcher*, University of California, Berkeley, 1994–1996

Research on hydrologic and geomorphic effects of transbasin water diversions, ecosystem services, and biogeochemical effects of experimental climate warming in subalpine ecosystems.

### TEACHING

*University of Montana, Department of Geosciences, Courses taught: General Geology* (Fall 2008), *Process Geomorphology* (Fall 2008, 2009), *Fluvial Geomorphology* (Spring 2008, 2009, 2010); *Fluvial Geomorphology and Riverine Ecosystems Seminar* (Fall 2007, 2009)

### PUBLICATIONS

Fuller, B. M., L. S. Sklar, Z. G. Compson, K. J. Adams, J. C. Marks, and **A. C. Wilcox**.

“Ecogeomorphic feedbacks in regrowth of travertine step-pool morphology after dam decommissioning, Fossil Creek, Arizona.” In press, *Geomorphology*.

Shafroth, P. B., **A. C. Wilcox**, D.A. Lytle, J. T. Hickey, D. C. Andersen, V.B. Beauchamp, A. Hautzinger, , L. McMullen, and A. Warner. 2010. “Ecosystem effects of environmental

flows: modeling and experimental floods in a dryland river.” *Freshwater Biology* 55:68-85, doi:10.1111/j.1365-2427.2009.02271.x.

- Wilcox, A. C.**, B. L. Peckarsky, B. W. Taylor, and A. C. Encalada. 2008. “Hydraulic and geomorphic effects on mayfly drift in high-gradient streams at moderate discharges.” *Ecohydrology* 1:176-186.
- Cui, Y. and **A. C. Wilcox**. 2008. “Development and application of numerical modeling of sediment transport associated with dam removal.” In M. Garcia, ed. *Sedimentation Engineering: Theory, Measurements, Modeling and Practice* (ASCE Manuals and Reports on Engineering Practice No. 110). American Society of Civil Engineers. pp. 995–1020.
- Wilcox, A. C.** and E. E. Wohl. 2007. “Field measurements of three-dimensional hydraulics in a step-pool channel.” *Geomorphology* 83:215–231.
- Comiti, F., L. Mao, **A. Wilcox**, E. E. Wohl, and M. A. Lenzi. 2007. “Field-derived relationships for flow velocity and resistance in step-pool streams.” *Journal of Hydrology* 340:48–62.
- Wilcox, A. C.** and E. E. Wohl. 2006. “Flow resistance dynamics in step-pool channels: 1. Large woody debris and controls on total resistance.” *Water Resources Research* 42: W05418, doi:10.1029/2005WR004277.
- Wilcox, A. C.**, J. M. Nelson, and E. E. Wohl. 2006. “Flow resistance dynamics in step-pool channels: 2. Partitioning between grain, spill, and woody debris resistance.” *Water Resources Research* 42: W05419, doi:10.1029/2005WR004278.
- Wohl, E. E. and **A. Wilcox**. 2005. “Channel geometry of mountain streams in New Zealand.” *Journal of Hydrology* 300:252–256.
- Wilcox, A.** and J. Harte. 1997. “Ecosystem services in a modern economy: Gunnison County, Colorado.” In G. Daily, ed. *Nature’s Services: Societal Dependence on Natural Ecosystems*. Island Press, Washington, D.C. pp. 311–328.

#### THESES AND OTHER PUBLICATIONS

- Rathburn, S. L., A. Meyer, C. Ferrantelli, **A. Wilcox**, D. Cadol, D. Kreiner, and T. Birdsall. 2007. “Introductory Geology Laboratory Manual for Colorado State University Students.” Pearson Custom Publishing, Boston, MA. 155 p.
- Wilcox, A.** and D. M. Merritt. 2005. “Effects of modified flow regimes on the Dolores River.” In *Riparian Response to Altered Flow Regimes*, Proceedings of the Colorado Riparian Assoc. 18<sup>th</sup> Annual Conference. Durango, CO. pp. 69–83.
- Wilcox, A. C.** 2005. “Interactions between Flow Hydraulics and Channel Morphology in Step-pool Streams.” Ph.D. thesis. Department of Geosciences. Colorado State University.
- Wilcox, A. C.** 1996. “Transmountain Water Diversions in the Colorado Rockies.” M.S. thesis. Energy and Resources Group. University of California, Berkeley.

#### PRESENTATIONS (\*=STUDENT AUTHOR)

- Woelfle-Erskine, C.\* and **A. C. Wilcox**. 2009. “Historical perspectives on channel pattern in the Clark Fork River, Montana and implications for post-dam removal restoration.” *EOS Trans. AGU*. 90(52) Fall Meet. Suppl. Abstract EP21B-0593.
- Wilcox, A. C.**, D. Brinkerhoff\*, L. Sklar. 2009. “Geomorphic evolution of the Clark Fork River, Montana in the first two years following breaching of Milltown Dam.” *Abstracts with Programs-Geological Society of America* 41(7), Paper No. 225-3.

- Brinkerhoff, D.\* and **A. C. Wilcox**. 2009. "Downstream response of depositional channel-forms to dam removal, Clark Fork River, Montana." *Abstracts with Programs-Geological Society of America* 41(7), Paper No. 38-7.
- Johnsen, J.W.\* and **A. C. Wilcox**. 2009. "Bedload transport following the removal of Milltown Dam, Clark Fork River, Montana." *Abstracts with Programs-Geological Society of America* 41(7), Paper No. 38-6.
- Wilcox, A. C.** 2009. "Ecogeomorphic feedbacks, tamarisk, and environmental flows in arid-region rivers." Utah State University Spring Runoff Conference. 2–3 April. Logan, UT. (invited keynote).
- Shafroth, P.B. and **A. C. Wilcox**. 2009. "Riparian vegetation response to environmental flow implementation along an arid-region river in western USA." International Conference on Implementing Environmental Flow Allocations, 23-26 Feb. Port Elizabeth, South Africa.
- Wilcox, A. C.**, D. Brinkerhoff\*, C. Woelfle-Erskine\*. 2008. "Initial geomorphic responses to removal of Milltown Dam, Clark Fork River, Montana, USA." *EOS Trans. AGU*. 89(53) Fall Meet. Suppl. Abstract H41I-07.
- Epstein, J.A.\* and **A. C. Wilcox**. 2008. "Reservoir sediment evacuation and channel evolution: Upstream geomorphic response of the Blackfoot River, Montana, to removal of Milltown Dam." *EOS Trans. AGU*. 89(53) Fall Meet. Suppl. Abstract H43B-0994.
- Cui, Y., B.K. Orr, **A. Wilcox**, J. Vick, C. Podolak, and P. Wilcock. 2008. "Marmot Dam removal: Predictions and observations." *EOS Trans. AGU*. 89(53) Fall Meet. Suppl. Abstract H41I-06.
- Wilcox, A. C.**, P.B. Shafroth, R.R. McDonald, P.J. Kinzel and J.M. Nelson. 2008. "Interactions among river flow, geomorphic processes, and riparian vegetation: implications for quantifying ecosystem flow requirements." Colorado River Basin Science and Resource Management Symposium. 18-20 November. Scottsdale, AZ.
- Wilcox, A. C.** 2008. "Ecogeomorphic processes and feedbacks in mountains streams." Rocky Mountain Biological Laboratory, Gothic, CO. Invited seminar. 5 August.
- Wilcox, A. C.**, P.B. Shafroth, and R.R. McDonald. 2008. "Topographic input for two-dimensional hydraulic modeling along a desert river to investigate flow-vegetation feedbacks." National Center for Airborne Laser Mapping Workshop: Study Earth Surface Processes with High-Resolution Topographic Data. 16–18 June. Boulder, CO.
- Wilcox, A. C.**, P.B. Shafroth, and R.R. McDonald. 2008. "Feedbacks among floods, geomorphic processes, and riparian vegetation seedlings in a desert river." 20–23 May. Meeting of Young Researchers in Earth Sciences (MYRES): Dynamic Interactions of Life and its Landscape. New Orleans, LA.
- Sklar, L.S., B.M. Fuller, Z. Compson, K. Adams, J.C. Marks, **A.C. Wilcox**. 2008. "Feedbacks between biotic and abiotic processes in a travertine step-pool stream: Implications for new magnitude-frequency paradigm." 20–23 May. Meeting of Young Researchers in Earth Sciences (MYRES): Dynamic Interactions of Life and its Landscape. New Orleans, LA.
- Wilcox, A. C.**, P.B. Shafroth, and R.R. McDonald. 2007. "Controlled floods, geomorphic processes, and riparian vegetation mortality in a sand-bed desert river." *EOS Trans. AGU*. 88(52) Fall Meet. Suppl. Abstract H34A-05.
- Wilcox, A. C.**, P.B. Shafroth, R.R. McDonald, P.J. Kinzel, J.M. Nelson. 2007. "Interactions among river flow, geomorphic processes, and riparian vegetation: field studies and computational modeling of a sand-bed desert river." Ecological Society of America / Society of Ecological Restoration Joint Meeting. 5–10 August. San Jose, CA.

- Wilcox, A. C.** 2007. "Effects of a controlled flood release on native versus non-native riparian vegetation and geomorphic processes in a desert river." American Assoc. of Geographers Annual Meeting. 18–21 April. San Francisco, CA.
- Wilcox, A. C.,** P.B. Shafroth, R.R. McDonald, P.J. Kinzel, J.M. Nelson. 2007. "Interactions among river flow, geomorphic processes, and riparian vegetation." National Surface Water Conference & Hydroacoustics Workshop. 2–6 April. St. Louis, MO.
- Kinzel, P.J., R.R. McDonald, J.M. Nelson, **A.C. Wilcox.** 2007. "Use of laboratory experiments to aid in testing numerical models of river channel evolution." National Surface Water Conference & Hydroacoustics Workshop. 2–6 April. St. Louis, MO.
- Fuller, B.\*, L. S. Sklar, Z. G. Compson, K. J. Adams, J. C. Marks, **A. C. Wilcox.** 2006. "Step-pool spacing in a travertine system, Fossil Creek, Arizona." *EOS Trans. AGU.* 87(52) Fall Meet. Suppl. Abstract H51G-0562.
- Wilcox, A. C.** and P. Shafroth. 2006. "Hydrogeomorphic effects of a controlled flood release on *Tamarix* and *Salix*, Bill Williams River, AZ." 2006 Tamarisk Research Conference: Current Status and Future Directions. Fort Collins, CO.
- Wilcox, A.,** F. Comiti, and E. Wohl. 2006. "Local-scale hydraulics and morphology in a steep channel, Italian Dolomites." European Geosciences Union General Assembly. Vienna, Austria. *Geophysical Research Abstracts* 8: 05239.
- Wilcox, A. C.** 2005. "Interactions between flow hydraulics and channel morphology in step-pool streams." USGS National Research Program seminar. Denver Federal Center, Lakewood, CO. 29 Nov.
- Wilcox, A.** and D. M. Merritt. 2005. "Effects of modified flow regimes on the Dolores River." Colorado Riparian Assoc. 18<sup>th</sup> Annual Conference. Durango, CO.
- Wilcox, A. C.** and E. E. Wohl. 2005. "Three-dimensional hydraulics in a step-pool channel." American Assoc. of Geographers Annual Meeting. Denver, CO.
- Wilcox, A. C.,** E. E. Wohl, and J. M. Nelson. 2004. "Flow resistance partitioning in step-pool channels." *EOS Trans. AGU.* 85(47) Fall Meet. Suppl. Abstract H43A-0370.
- Wilcox, A. C.** 2004. "Step-pool channels." Dept. of Land and Agro-Forest Environments, Univ. of Padua, Italy. 20 May.
- Wilcox, A.,** E. Wohl, and R. Turner\*. 2004. "Resistance partitioning in step-pool channels." AGU Hydrology Days. Fort Collins, CO.
- Wilcox, A. C.** and B. L. Peckarsky. 2003. "Linkages between hydraulics, morphology, and benthic communities in high-gradient streams." *EOS Trans. AGU.* 84(46) Fall Meet. Suppl. Abstract H52A-1151.
- Wilcox, A.** and E. Wohl. 2003. "Spatial and temporal patterns of velocity and turbulence in a step-pool channel." *Abstracts with Programs-Geological Society of America* 35(6), Paper No. 6-12.
- Wohl, E. E. and **A. Wilcox.** 2003. "Channel geometry of mountain rivers in New Zealand." *Abstracts with Programs-Geological Society of America* 35(6), Paper No. 6-13.
- Wilcox, A. C.** 2003. "Velocity and turbulence characteristics in a step-pool channel in the Colorado Rockies." Canadian Assoc. of Geographers Ann. Mtg. U. Victoria, BC Canada.
- Wilcox, A.,** E. Wohl, and J. Kray\*. 2002. "ADV measurements of velocity and turbulence characteristics in a step-pool channel." *EOS Trans. AGU.* 83(47) Fall Meet. Suppl. Abstract H11C-0854.
- Wilcox, A.,** E. Wohl, J. Kray\*, and G. Vallance\*. 2002. "Controls on hydraulic resistance in step-pool channels." *Abstracts with Programs- Geological Society of America* 87-14.

- Orr, B. K., C. A. Braudrick, **A. Wilcox**, J. C. Vick, S. H. Kramer, Y. Cui, and J. Keil. 2002. "Evaluation of geomorphic effects of the removal of Marmot Dam and potential impacts on anadromous salmonids." Hydrovision 2002 Conference. Portland, OR.
- Wilcox, A.**, E. Wohl, J. Kray\*, and K. Schmidt\*. 2002. "A flume study of hydraulic resistance in step-pool channels." AGU Hydrology Days. Fort Collins, CO.
- Wilcox, A.** and E. Wohl. 2001. "Hydraulic resistance in steep channels." *EOS Trans. AGU*. 82(47) Fall Meet. Suppl. Abstract H52B-0408.
- Wilcox, A.**, Y. Cui, J. Vick, and W. Dietrich. 2000. "Geomorphic assessment and numerical modeling of sediment transport associated with dam removal: Case study of Marmot Dam, Sandy River, OR." *EOS Trans. AGU*. 81(48) Fall Meet. Suppl. Abstract H12E-07.
- Wilcox, A.** 1996. "Geomorphic and hydrological effects of transmountain water diversions in the Colorado Rockies." AGU Hydrology Days. Fort Collins, CO.

## GRANTS

- National Science Foundation. "Sediment routing in gravel-bed rivers following dam removal." 2009-2011
- National Park Service, Intermountain Region-CESU. "Glacial outburst analysis and report study, Bear Glacier, Kenai Fjords National Park, Alaska." 2009-2011
- National Park Service, Intermountain Region-CESU. "Coal mine and coalbed methane development threats to aquatic biota of Glacier National Park." 2009-2012
- USEPA and US Forest Service. "Linkages among river restoration, physical habitat, ecosystem processes, and water quality: Upper Blackfoot River, Mike Horse Mine, Montana." 2009-2010
- University Grant Program. "Sediment routing in gravel-bed rivers following dam removal." U. Montana, 2009
- Trout Unlimited. "Proposal for Mattie V Creek channel design." 2008-2009
- National Science Foundation, Small Grant for Exploratory Research (SGER). "Dam removal and the response of gravel-bed rivers to sediment pulses: Sediment transport and channel evolution in the Clark Fork River, MT following removal of Milltown Dam." 2008-2010
- Montana Water Center / U.S. Geological Survey 104(b) Water Resources Research Program. "Evolution of channel morphology and aquatic habitat in the Middle Clark Fork River following removal of Milltown Dam." 2008-2010
- University Grant Program. "Dam removal and river response to increased sediment supply: Investigation of downstream sediment transport and channel change in the Clark Fork River following removal of Milltown Dam." U. Montana, 2008
- National Science Foundation, International Program Grant. "Flow hydraulics along step-pool channels." 2003-2004 (PI: E. Wohl; grant co-written by A. Wilcox)
- Warner-Chevron Graduate Research Grant. "Flow hydraulics, morphology, and aquatic habitat in step-pool stream channels." Dept. of Geosciences, Colorado State University, 2003
- Geological Society of America Graduate Research Grant. "Velocity structure, turbulence, and morphology of steep mountain stream channels." 2002
- Undergraduate Research Opportunities Small Grant. "Hydraulic development and the Arab-Israeli conflict." Stanford University, 1991

## HONORS, FELLOWSHIPS, SCHOLARSHIPS

### *National / State*

- AGU Editors' Citation for Excellence in Refereeing, *Water Resources Research*, 2005
- First place, Colorado Scientific Society Student Oral Presentation Competition, 2004
- Geological Society of America Outstanding Student Research Award, Research grant proposal recognized for exceptional high merit in concept and presentation, 2002
- J. Hoover Mackin Award, Honorable Mention, Quaternary Geology Division, GSA, 2002
- Richard M. Herbert Memorial Scholarship, American Water Resources Association, 2001
- Best M.S. Student Poster, AGU Hydrology Days Conference, Fort Collins, CO, 1996

### *Colorado State University*

- First place, Dept. of Geosciences Student Oral Presentation Competition, 2004
- Anderson Graduate Scholarship (2003–2004), Lary Kent Burns Memorial Scholarship (2002–2003), Stanley Schumm Graduate Scholarship, (2001–2002), University Supplemental Fellowship (2000–2001)
- Edward M. Warner Research Assistant, Dept. of Geosciences, 2003–2004

### *Stanford University*

- Graduated with Honors and Distinction in major, 1992
- Robert M. Golden Medal for Excellence in Humanities and Creative Arts (awarded for senior honors thesis, "The Remaking of Zion: Hydraulic Development in Israel, 1948–1967"), 1992

## PROFESSIONAL EXPERIENCE

*Environmental Flows Advisor*, The Nature Conservancy Colorado, 2004–2007

*Geomorphologist / Project Manager*, Stillwater Sciences, Berkeley, CA, 1997–2000

*Geomorphologist*, Trihey and Associates, Concord, CA, 1996

*Hydrology Intern*, The Nature Conservancy, Boulder, CO, 1993–1994

*Park Ranger*, Yosemite National Park, Denali National Park, Summers 1992–1994

## SYNERGISTIC ACTIVITIES

### *Reviewer*

- Journals: *Geophysical Research Letters*, *GSA Bulletin*, *Water Resources Research*, *Freshwater Biology*, *Ecological Modelling*, *Environmental Management*, *GSA Special Paper*
- National Science Foundation: Hydrologic Sciences, Geomorphology and Land-Use Dynamics, Geography and Regional Science, Collaborations in Mathematical Geosciences, Geobiology and Low-Temperature Geochemistry
- Other: CalFed Science Program, U.S. Geological Survey peer review, Sacramento Municipal Utility District technical review

### ***Workshops / Short Courses / Conference Sessions***

- “Teaching Geomorphology in the 21<sup>st</sup> Century,” On the Cutting Edge, National Association of Geoscience Teachers, Fort Collins, CO, 2008
- “Studying Earth Surface Processes with High-Resolution Topographic Data Workshop,” National Center for Airborne Laser Mapping, Boulder, CO, 2008
- “Meeting of Young Researchers in Earth Sciences (MYRES): Dynamic Interactions of Life and Its Landscape,” New Orleans, LA, 2008
- “River Restoration Science: Research and Application in Restoration Design and Environmental Flows,” Session convener, Fall 2007 Amer. Geophysical Union Meeting
- “Pathways to Scientific Teaching,” University of Montana, 2007
- “Low-slope sand-bed rivers,” National Center for Earth-surface Dynamics, 2006
- “Multidimensional Surface Water Modeling System,” USGS, 2001

### ***Member***

- American Geophysical Union, Geological Society of America, GSA Quaternary Geology and Geomorphology Division
- Federal Advisory Committee on Water Information’s Subcommittee on Sedimentation, 2008-present
- Missoula County, MT Stream Protection Technical Advisory Committee, 2008-present
- Member, University of Montana Faculty Senate, 2009-present
- Associate Director, UM Center for Riverine Science and Stream Renaturalization, 2009-present
- University of Montana Search Committees: Aquatic Invertebrate Ecologist (2008), Watershed Hydrologist (2009)
- Dolores River (CO) Dialogue Science Committee, 2004-2007

### ***Media***

- “Murky movement: Milltown Dam removal releases sediments,” P. Stephens, *Vision* 2009: 22-24, <http://www.umt.edu/urelations/vision/2009/murky%20movement.html>
- “River of research: For UM scientist, breach a study opportunity,” J. Cramer, *Missoulian* 28 March 2008, <http://missoulian.com/articles/2008/03/28/news/mtregional/news11.txt>
- “An interview with Dr. Andrew Wilcox,” *Montana Water News*, January 2008, [http://water.montana.edu/mwnewsletter/archives/newsletter\\_08\\_01.htm](http://water.montana.edu/mwnewsletter/archives/newsletter_08_01.htm)