

Jonathan H. Tomkin

Curricula Vitae

University of Illinois at Urbana-Champaign
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Current Position

Associate Director of Academic Affairs, School of Earth, Society, and Environment
Research Assistant Professor, Dept. of Geology, University of Illinois

Education

PhD., Earth Sciences, Australian National University (2002).

Thesis: *Landforming Processes in Glaciated Orogens: a Numerical Study*. Advisor: Jean Braun

BSc. (Hons), 1st class, Physics, University of Melbourne (1996).

Thesis: *An analysis of the two nucleon effective interaction in ^{20}Ne at 135 Mev*. Advisor: Ken Amos

Prior Academic employment

Assistant Professor, Louisiana State University, Department of Geology and Geophysics, 2003-2006

Damon Wells Postdoctoral Fellow, Department of Geology and Geophysics, Yale University, 2000-2002.

Funded Research Proposals

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|---------|-----------|-----------|-------|
| NSF ANT | \$346,713 | 2006-2008 | co-PI |
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WAIS grounding-zone migrations in Eastern Basin, Ross Sea and the LGM dilemma: New strategies to resolve the style and timing of outer continental shelf grounding events

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| NSF EAR | \$90,632 | 2005-2007 | PI |
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Glacial Erosion in the Patagonian Andes: Testing the Buzzsaw

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| ACS PRF | \$35,000 | 2006-2008 | PI |
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The effect of late Cenozoic glaciation on the evolution of the Olympic Mountains

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| CoR FRG | \$9,318 | 2005-2006 | PI |
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Unraveling climate and tectonic feedbacks in the Olympic Mountains via numerical simulations

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| NSF EPSCoR PFUND | \$11,450 | 2005 | PI |
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Numerically modelling feedbacks between climate, erosion and tectonics in the Patagonian Andes

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| CoRSS | \$5,000 | 2003 | PI |
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Investigating the coupled response of tectonics to increased glaciation in the Southern Andes

Funded Education Proposals

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| NSF EAR Geoscience Alliance to Enhance Minority Participation | \$1,204,416 | 2003-2008 | co-PI |
| LSU BoR Classroom development grant | \$20,000 | 2005 | co-PI |
| IBHE The Lifelong Learning IN Illinois Project (I-LLINI project) | \$75,000 | 2007-2009 | partner |
| IBHE Mathematics Science Partnership: Sense-Making in Science and Mathematics | TBA | 2008-2011 | partner |

Peer Reviewed Publications

M.D. Blum, J.H. Tomkin, A. Purcell, R. Lancaster. Ups and downs of the Mississippi delta. *Geology*, vol. 36, 675-678, 2008.

B.B. Ellwood, J.H. Tomkin, L.A. Febo, and C.N. Stuart Jr. Time Series Analysis of Magnetic Susceptibility Variations in Deep Marine Sediments: A Test Using Upper Danian-Lower Selandian Proposed GSSP, Spain. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 261, 270-279, 2008.

Ellwood, B.B., Tomkin, J.H., Ratcliffe, K.T., Wright, M., Kafafy, A.M., 2008. High Resolution Magnetic Susceptibility and Geochemistry for the Cenomanian/Turonian Boundary GSSP with Correlation to Time Equivalent Core. *Palaeogeography, Palaeoclimatology, Palaeoecology* doi: 10.1016/j.palaeo.2008.01.005

J.H. Tomkin, Coupling glacial erosion and tectonics at active orogens: a numerical modeling study. *Journal of Geophysical Research*, Vol. 112, F02015, doi:10.1029/2005JF000332, 2007.

J.H. Tomkin and G. Roe, Climate and tectonic controls on glaciated critical-taper orogens. *Earth and Planetary Science Letters*, Vol. 262, 385-397, 2007.

B.B. Ellwood, J.H. Tomkin, B.C. Richards, S.L. Benoist, L.L. Lambert, MSEC data sets record glacially driven cyclicity: Examples from the arrow canyon Mississippian–Pennsylvanian GSSP and associated sections. *Palaeogeography, Palaeoclimatology, Palaeoecology*, Vol. 255, 377–390, 2007.

J.H. Tomkin, Erosional feedbacks and the oscillation of ice masses. *Journal of Geophysical Research*, Vol. 108, No. B10, 2488 10.1029/2002JB002087 18 October 2003.

J.H. Tomkin, M.T. Brandon, F. J. Pazzaglia, J. Barbour and S. D. Willett. Quantitative testing of bedrock incision models, Clearwater River, WA. *Journal of Geophysical Research*, Vol. 108, No. B6, 2308 10.1029/2001JB000862, 20 June 2003.

J.H. Tomkin and J. Braun, The effect glaciation has on the relief of a fast growing orogen: a numerical modelling study. *American Journal of Science*, Vol. 302, pp 169-190, 2002.

J.H. Tomkin and J. Braun, Simple models of drainage reorganization on a tectonically active ridge system , *New Zealand Journal of Geology and Geophysics*, Vol. 42 pp 1-10, 1999.

J. Braun, D. Zwartz and J.H. Tomkin, A new surface processes model combining glacial and fluvial erosion, *Annals of Glaciology*, Vol. 28 pp 282-290, 1999.

Recent Abstracts (2004-2006)

Tomkin, J.H., and Roe, G. (2006). Glaciated orogenic wedges: sensitivity of tectonics to climate change. EGU General Meeting, Vienna.

Ellwood B.B., Kafafy A., Kassab A., Tomkin J.H., Abdeldayem A., Obaidalla N., Willson K., and Thompson D.E. (2006). Magnetostratigraphy Susceptibility Used for High Resolution Correlation Among Paleocene/Eocene Boundary Sequences in Egypt, Spain and the U.S.A.. AGU Joint Meeting, Baltimore.

Thomson, S. N., Tomkin, J.H., Brandon, M.T. and Reiners, P.W. (2006). Late Cenozoic erosional history of the Patagonian Andes: a key to understanding the importance of climate change and glacial erosion in controlling mountain development. GSA Backbone of the Americas Meeting, Mendoza, Argentina.

Tomkin, J.H., and Roe, G. (2006). Response of a glaciated, steady-state critical wedge orogen to changes in climate. AGU Fall Meeting, San Francisco.

Thomson, S. N., Tomkin, J.H., Brandon, M.T. and Reiners, P.W. (2005). The role of the glacial buzzsaw in active orogen development: Testing theoretical models with observed variations in erosion rate in the Patagonian Andes. European Geosciences Union General Assembly 2005, Vienna, Austria, 24 - 29 April 2005, Geophysical Research Abstracts, Vol. 7, 08985.

Thomson, S. N., Tomkin, J.H., Brandon, M.T. and Reiners, P.W. (2005). Is the late Cenozoic orogenic development of the Patagonian Andes controlled by glacial erosion? Thermochronologic testing of numeric models. 19th Colloquium on Latin American Geosciences, GeoForschungsZentrum Potsdam, Germany.

R. Ferrell, P. Bart., L. Anderson, J.M. Lorenzo and J.H. Tomkin (2004). The “top-down” approach: a course design to stimulate minority interest in geoscience. GSA Annual Meeting, Denver.

B.B. Ellwood, J.H. Tomkin, C. Brett, and W.D. Macdonald (2004). A test of the magneto-stratigraphic susceptibility method: high resolution correlation of a well-defined marine succession, the Upper Ordovician (Endian) Kope Formation, Kentucky, and development of floating point time scales. GSA Annual Meeting, Denver.

J.H. Tomkin and M.T., Brandon (2004). The results of coupled climate/tectonic numerical and analytical models of margin development during episodes of climate change. AGU Fall meeting, San Francisco.

R. A. Zapata, J.M. Lorenzo, M.D. Blum, P.J. Bart, and J.H. Tomkin (2004). A New Elastic-Viscous Model to Constrain Holocene Relative Sea Level Along the Northern Margin Gulf of Mexico. AGU Fall meeting, San Francisco.

J.M. Lorenzo, P. Bart., R. Ferrell, L. Anderson, and J.H. Tomkin (2004). A Three-Day Seismic Experiment in an Urban Setting: An Introduction to Seismology for Minority Students. AGU Fall meeting, San Francisco.

R. Ferrell, P. Bart., L. Anderson, J. M. Lorenzo and J.H. Tomkin (2004). The Non-traditional Student, a new Geoscience Resource. AGU Fall meeting, San Francisco.

L. Anderson, R. Ferrell, P. Bart., J. M. Lorenzo and J.H. Tomkin (2004). LSU Geoscience Alliance to Enhance Minority Participation: Building Partnerships with Minority-Serving Institutions. AGU Fall meeting, San Francisco.

Academic Reviews

American Journal of Science
Geology
GSA Penrose Special Paper
Journal of Geophysical Research
Earth and Planetary Sciences
Nature Geoscience
Australian Research Council (proposal review)
National Science Foundation (proposal reviews)

Courses Taught

Current Research in Geoscience (GEOL 591) 2007,2008
Earth System Seminar (ESES 200) 2007, 2008
GAEMP summer school 2004-2006.
Geodynamics (GEOL 552), 2007
Geophysics Seminar 2006.
Physical Geology (GEOL 1001) 2003-2005. Alpha Lambda Delta Honor Society Teaching Award (2005)
Numerical Methods in Geology (GEOL 7065) 2004, 2006.
Tectonic Geomorphology (LSU, GEOL 7002) 2005. BASC Excellence in Teaching Award (2005)
Tectonic Geomorphology (UIUC, GEOL 593), 2008

Recent Workshops

NSF GLD, *Workshop on "Climate over Landscapes"*, Boulder, CO, 1-2 Oct 2007

NSF CIG, *Workshop on Geodynamic Modeling of Tectonic Processes*, Breckenridge, CO, 10-12 June 2005

NSF Cutting Edge, *Early Career Faculty Workshop: Teaching, Research, and Managing Your Career*, College of William and Mary, Williamsburg, VA, June 12-17 2004

Recent Invited Conference Talks

Pardee Keynote Symposium, GSA Annual Meeting, 2006
AGU Fall meeting, 2006
GSA Penrose Meeting, Taiwan 2003

Principal Areas of Research Interest

- Defining interactions between surface processes and mountain evolution in tectonically active regions at orogen, basin, and sub-basin scales by testing process based models against thermochronological data. Studied field areas include the Southern Alps of New Zealand, the Olympic Mountains of Washington State, and the Patagonian Andes.
- Ground truthing climate histories and geomorphological process models via the statistical analysis of geomorphological and geochemical data. Studied field areas include the Clearwater River in Washington State, the dry valleys of Antarctica, and the Garonne River, in France.
- Improving the theoretical understanding of glacial action on landscapes via numerical and analytical models of glacial and landscape evolution.

Areas of Technical Expertise

- Numerical and mathematical modeler with particular interest in geodynamical systems and continuum mechanics.
- Statistical data analysis and modeling
- Developer of finite-element and finite-difference models of landscape, ice-cap and orogenic evolution.
- Use of statistical data analysis, high end UNIX computer platforms and software, Fortran 77/90 computer programming, and three-dimensional data display.