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EDUCATION

Ph.D., Geosciences, Pennsylvania State University, 1996

A.B. with honors in Anthropology, Brown University (cum laude), 1988

ACADEMIC APPOINTMENTS

2013 – present Professor, CIRES and Department of Geological Sciences, University of Colorado, Boulder, USA

2007 – 2013 Associate Professor, CIRES and Department of Geological Sciences, University of Colorado, Boulder, USA

2010 Visiting Scientist, Institut des Sciences de la Terre, Grenoble, France

2004 – 2007 Assistant Professor, CIRES and Department of Geological Sciences, University of Colorado, Boulder, USA

2000 – 2003 University Lecturer in Geocomputation, School of Geography and the Environment, Oxford University, UK

2000 – 2003 Tutorial Fellow in Geography, Brasenose College, Oxford, UK

1997 – 2000 Research Associate, Department of Civil and Environmental Engineering, MIT, USA

1996 Postdoctoral Associate, Department of Civil and Environmental Engineering, MIT, USA

HONORS AND AWARDS

Ralph Alger Bagnold Medal, European Geosciences Union, 2012

Boulder Faculty Assembly Teaching Excellence Award, University of Colorado, 2013

PUBLICATIONS

Refereed Journal Articles and Book Chapters

(*Denotes student author; ** post-doctoral author; *** undergraduate author)

71. Griffin, E.R., Perignon*, M.C., Friedman, J.M., and **Tucker, G.E.** (in press) Effects of woody vegetation on overbank sand transport during a large flood, Rio Puerco, New Mexico. *Geomorphology*.

70. Kean, J.W., McCoy*, S.W., **Tucker, G.E.**, Staley, D.M., and Coe, J.A. (in press) Runoff-generated debris flows: Observations and modeling of surge initiation, magnitude, and frequency. *Journal of Geophysical Research*, 118, doi:10.1002/jgrf.20148.

69. Anderson, R.S., Anderson, S.P., and **Tucker, G.E.** (2013) Rock damage and regolith transport by frost: an example of climate modulation of geomorphology of the critical zone. *Earth Surface Processes and Landforms*, doi:10.1002/esp.3330.

68. Bradley*, D.N., and **Tucker, G.E.** (2013) Storage time, age, and erosion hazard of laterally accreted sediment on the floodplain of a simulated meandering river. *Journal of Geophysical Research*, 10.1002/jgrf.20083.

67. Godard, V., **Tucker, G.E.**, Fisher, G.B., Burbank, D.W., and Bookhagen, B. (2013) Frequency-dependent landscape response to climatic forcing. *Geophysical Research Letters*, doi:10.1002/grl.50253.
66. McCoy*, S.W., **Tucker, G.E.**, Kean, J.W., and Coe, J.A. (2013) Field measurement of basal forces generated by erosive debris flows. *Journal of Geophysical Research*, doi:10.1002/jgrf.20041.
65. Perignon*, M.C., **Tucker, G.E.**, Griffin, E.R., and Friedman, J. (2013) Effects of riparian vegetation on topographic change during a large flood event, Rio Puerco, New Mexico, USA. *Journal of Geophysical Research*, doi:10.002/jgrf.20073.
64. **Tucker, G.E.**, and van der Beek, P. (2013) A model for post-orogenic development of a mountain range and its foreland. *Basin Research*, v. 12, p. 1-19, doi: 10.1111/j.1365-2117.2012.00559.x.
63. Anderson, S.P., Anderson, R.S., and **Tucker, G.E.** (2012) Landscape-scale linkages in critical-zone evolution. *Comptes Rendus Geosciences*, v. 344, p. 586-596, doi:10.1016/j.crte.2012.10.008.
62. Bradley*, D.N., and **Tucker, G.E.** (2012) Measuring gravel transport and dispersion in a mountain river using passive radio tracers. *Earth Surface Processes and Landforms*, v. 37, p. 1034-1045, doi:10.1002/esp.3223.
61. McCoy*, S.W., Kean, J.W., Coe, J.A., **Tucker, G.E.**, Staley, D.M., and Wasklewicz, T.A. (2012) Sediment entrainment by debris flows: In situ measurements from the headwaters of a steep catchment. *Journal of Geophysical Research*, v. 117, F03016, doi:10.1029/2011JF002278.
60. Attal, M., Cowie, P.A., Whittaker, A.C., Hopley*, D., **Tucker, G.E.**, and Roberts, G.P. (2011) Testing fluvial erosion models using the transient response of bedrock rivers to tectonic forcing in the Apennines, Italy, *Journal of Geophysical Research*, v. 116, F02005, doi:10.1029/2010JF001875.
59. Hoke*, M., Hynek, B., and **Tucker, G.E.** (2011) Formation timescales of large Martian valley networks, *Earth and Planetary Science Letters*, doi:10.1016/j.epsl.2011.09.053.
58. McCoy*, S.W., Coe, J.A., Kean, J.W., **Tucker, G.E.**, Staley, D.M., and Wasklewicz, T.A. (2011) Observations of debris flows at Chalk Cliffs, Colorado, U.S.A.: part 1, in situ measurements of flow dynamics, tracer particle movement and video imagery from the summer of 2009, In Genevois, R., Hamilton, D.L., and Prestininzi, A, eds., Proceedings of the 5th International Conference on Debris Flow Hazards Mitigation, Mechanics, Prediction and Assessment, Padua, Italy, June 14-17, 2011, *Italian Journal of Engineering Geology and Environment* and Casa Editrice Universita La Sapienza, Rome, Italy. doi:10.4408/IJEGE.2011-03.B-078.
57. Staley, D.M., Wasklewicz, T.A., Coe, J.A., Kean, J.W., McCoy*, S.W. and **Tucker, G.E.** (2011) Observations of debris flows at Chalk Cliffs, Colorado, USA: part 2, changes in surface morphometry from terrestrial laser scanning in the summer of 2009, In Genevois, R., Hamilton, D.L., and Prestininzi, A, eds., Proceedings of the 5th International Conference on Debris Flow Hazards Mitigation, Mechanics, Prediction and Assessment, Padua, Italy, June 14-17, 2011, *Italian Journal of Engineering Geology and Environment* and Casa Editrice Universita La Sapienza, Rome, Italy, p. 759-768.
56. **Tucker, G.E.**, McCoy*, S.W., Whittaker, A.C., Roberts, G.P., Lancaster, S.T., and Phillips, R. (2011) Geomorphic significance of postglacial bedrock scarps on normal-fault footwalls, *Journal of Geophysical Research*, v. 116, F01022, doi:10.1029/2010JF001861.
55. Wilcox*, T., Mueller, K., Upton, P., Chen, Y.-G., Huang, S.T., Yanites**, B., and **Tucker, G.** (2011) Linking Taiwan's Subcritical Hsueshan Range Topography and Foreland Basin Architecture, *Tectonics*, v. 30, TC4011, doi:10.1029/2010TC002825.
54. Yanites*, B.J., **Tucker, G.E.**, Hsu H.-L., Chen C.-C., Chen Y.-G., Mueller, K.J. (2011) The influence of sediment cover variability on long-term river incision rates: an example from the Peikang River, central Taiwan, *Journal of Geophysical Research*, v. 116, F03016, doi:10.1029/2010JF001933.
53. Bradley*, D.N., **Tucker, G.E.**, and Benson, D. (2010) Fractional dispersion in a sand-bed river: *Journal of Geophysical Research*, v. 115, F00A09, doi:10.1029/2009JF001268.

52. McCoy*, S.W., Kean, J.W., Coe, J.A., Staley, D.M., Wasklewicz, T.A., and **Tucker, G.E.** (2010) Evolution of a natural debris flow: in situ measurements of flow dynamics, video imagery, and terrestrial laser scanning: *Geology*, v. 38, p. 735-738, doi:10.1130/G30928.1.
51. **Tucker, G.E.**, and Bradley*, D.N. (2010) Trouble with diffusion: reassessing hillslope erosion laws with a particle-based model: *Journal of Geophysical Research*, v. 115, F00A10, doi:10.1029/2009JF001264.
50. **Tucker, G.E.**, and Hancock, G.R. (2010) Modelling landscape evolution: *Earth Surface Processes and Landforms*, v. 35, p. 28-50.
49. van Balen, R., Busschers*, F., and **Tucker, G.E.** (2010) Modeling the response of the Rhine-Meuse fluvial system to late Pleistocene climate change: *Geomorphology*, v. 114, no. 3, p. 440-452.
48. Wobus**, C.W., **Tucker, G.E.**, and Anderson, R.S. (2010) Does climate change create distinctive patterns of landscape incision?, *Journal of Geophysical Research*, v. 115, F04008, doi:10.1029/2009JF001562.
47. Yanites*, B.J., and **Tucker, G.E.** (2010) Controls and limits on bedrock channel geometry: *Journal of Geophysical Research*, v. 115, F04019, doi:10.1029/2009JF001601.
46. Yanites*, B.J., **Tucker, G.E.**, Mueller, K.J., and Chen Y.-G. (2010) How rivers react to large earthquakes: Evidence from central Taiwan. *Geology*, v. 38, no. 7, p. 639-642, doi:10.1130/G30883.
45. Yanites*, B.J., **Tucker, G.E.**, Mueller, K.J., Chen Y.-G., Wilcox*, T., Huang* S.-Y., and Shi* K.-W. (2010) Incision and channel morphology across active structures in the Peikang River, central Taiwan: Implications for the importance of channel width. *Geological Society of America Bulletin*, v. 122, p. 1192-1208.
44. **Tucker, G.E.** (2009) Natural experiments in landscape evolution: *Earth Surface Processes and Landforms*, v. 34, p. 1450-1460, doi:10.1002/esp.1833.
43. Yanites*, B.J., **Tucker, G.E.**, and Anderson, R.S. (2009) Numerical and analytical models of cosmogenic radionuclide dynamics in landslide-dominated drainage basins: *Journal of Geophysical Research*, v. 114, F01007, doi:10.1029/2008JF001088.
42. Attal**, M., **Tucker, G.E.**, Whittaker*, A.C., Cowie, P.A., and Roberts, G.P. (2008) Modeling fluvial incision and transient landscape evolution: Influence of dynamic channel adjustment: *Journal of Geophysical Research*, v. 113, doi:10.1029/2007JF000893.
41. Cowie, P.A., Whittaker*, A.C., Attal**, M., Roberts, G., **Tucker, G.E.**, and Ganas, A. (2008) New constraints on sediment-flux-dependent river incision: implications for extracting tectonic signals from river profiles. *Geology*, v. 36, no. 7, p. 535-538.
40. Fleurant, C., **Tucker, G.E.**, and Viles, H.A. (2008) Modelling cockpit karst landforms. In: Gallagher, K., Jones, S.J., and Wainwright, J., eds., *Landscape Evolution: Denudation, Climate and Tectonics over Different Time and Space Scales*. Geological Society of London Special Publication 296.
39. Gasparini, N.M., Bras, R.L., and **Tucker, G.E.** (2008) Numerical predictions of the sensitivity of grain size and channel slope to an increase in precipitation. In: Rice, S.P., Roy, A.G., and Rhoads, B.L., eds., *River Confluences, Tributaries and the Fluvial Network*, John Wiley & Sons.
38. Whittaker*, A.C., Attal**, M., Cowie, P.A., **Tucker, G.E.**, and Roberts, G.P. (2008) Decoding temporal and spatial patterns of fault uplift using transient river long profiles: *Geomorphology*, v. 100, no. 3-4, p. 506-526, doi:10.1016/j.geomorph.2008.01.018.
37. Wobus**, C.W., Kean, J.W., **Tucker, G.**, and Anderson, R.S. (2008) Modeling the evolution of channel shape: balancing computational efficiency with hydraulic fidelity: *Journal of Geophysical Research*, v. 113, F02004, doi:10.1029/2007JF000914.
36. Arnold*, L.J., Bailey**, R.M., and **Tucker, G.E.** (2007) Statistical treatment of fluvial dose distributions from southern Colorado arroyo deposits: *Quaternary Geochronology*, v. 2, p. 162-167.
35. Lyew-Ayee*, P., Viles, H.A., and **Tucker, G.E.** (2007) The use of GIS-based digital morphometric techniques in the study of cockpit karst: *Earth Surface Processes and Landforms*, v. 32, no. 2, p. 165-179, doi: 10.1002/esp.1399.

34. Solyom^{*}, P.B., and **Tucker, G.E.** (2007) The importance of the catchment area-length relationship in governing non-steady state hydrology, optimal junction angles and drainage network pattern: *Geomorphology*, v. 88, p. 84-108.
33. Whittaker^{*}, A.C., Cowie, P.A., Attal^{**}, M., **Tucker, G.E.**, and Roberts, G.P. (2007) Bedrock channel adjustment to tectonic forcing: implications for predicting river incision rates: *Geology*, v. 35, no. 2, p. 103-106, doi: 10.1130/G23106A.1.
32. Whittaker^{*}, A.C., Cowie, P.A., Attal^{**}, M., **Tucker, G.E.**, and Roberts, G.P. (2007) Contrasting transient and steady-state rivers crossing active normal faults: new field observations from the Central Apennines, Italy. *Basin Research*, doi:10.1111/j.1365-2117.2007.00337.x.
31. Clevis^{**}, Q., **Tucker, G.E.**, Lock, G., Lancaster, S.T., A., Gasparini^{*}, N., Desitter, and Bras, R.L. (2006) Geoarchaeological simulation of meandering river deposits and settlement distributions; a three-dimensional approach. *Geoarchaeology*. v. 21, no. 8, p. 843-874, doi:10.1002/gea.20142.
30. Clevis^{**}, Q., **Tucker, G.E.**, Lancaster, S.T., Desitter, A., Gasparini^{*}, N., and Lock, G. (2006) A simple algorithm for the mapping of TIN data onto a static grid: applied to the stratigraphic simulation of river meander deposits. *Computers and Geosciences*, v. 32, p. 749-766.
29. Cowie, P.A., Attal^{**}, M., **Tucker, G.E.**, Whittaker^{*}, A.C., Naylor, M., Ganas, A., and Roberts, G.P. (2006) Investigating the surface process response of fault interaction and linkage using a numerical modeling approach. *Basin Research*, v. 18, p. 231-266.
28. **Tucker, G.E.**, Arnold^{*}, L.J., Bras, R.L., Flores^{*}, H., Istanbuluoglu, E., and Solyom^{*}, P. (2006) Headwater channel dynamics in semi-arid rangelands, Colorado high plains, USA. *Geological Society of America Bulletin*, v. 118, no. 7/8, p. 959-974.
27. Wobus^{**}, C.W., **Tucker, G.E.**, and Anderson, R.S. (2006) Self-formed bedrock channels. *Geophysical Research Letters*, v. 33, L18408, doi:10.1029/2006GL027182, 6pp.
26. Istanbuluoglu, E., Bras, R.L., Flores-Cervantes^{*}, H., and **Tucker, G.E.** (2005) Implications of bank failures and fluvial erosion for gully development: Field observations and modeling. *Journal of Geophysical Research*, v. 110, no. F1, F01014, doi:10.1029/2004JF000145.
25. **Tucker, G.E.** (2004) Drainage basin sensitivity to tectonic and climatic forcing: implications of a stochastic model for the role of entrainment and erosion thresholds. *Earth Surface Processes and Landforms*, v. 29, p. 185-205.
24. Collins^{*}, D.B.G., Bras, R.L., and **Tucker, G.E.** (2004) Modeling the effects of vegetation-erosion coupling on landscape evolution. *Journal of Geophysical Research*, v. 109, F03004, doi:10.1029/2003JF000028.
23. Gasparini^{*}, N.M., **Tucker, G.E.**, and Bras, R.L. (2004) Network-scale dynamics of grain-size sorting: implications for downstream fining, stream-profile concavity, and drainage basin morphology. *Earth Surface Processes and Landforms*, v. 29, p. 401-421.
22. Solyom^{*}, P., and **Tucker, G.E.** (2004) Effect of limited storm duration on landscape evolution, drainage basin geometry, and hydrograph shapes. *Journal of Geophysical Research*, v. 109, F03012, doi:10.1029/2003JF000032.
21. Baldwin^{*}, J.A., Whipple, K.X., and **Tucker, G.E.** (2003) Implications of the shear-stress river incision model for the timescale of post-orogenic decay of topography. *Journal of Geophysical Research*, v. 108, no. B3, doi: 10.1029/2001JB000550.
20. Bogaart^{*}, P.W., **Tucker, G.E.**, and de Vries, J.J. (2003) Channel network morphology and sediment dynamics under alternating periglacial and temperate regimes: A numerical simulation study. *Geomorphology*, v. 54, no. 3/4, p. 257-277.
19. Bras, R.L., **Tucker, G.E.**, and Teles^{**}, V.T. (2003) Six myths about mathematical modeling in geomorphology. In: *Prediction in Geomorphology*, edited by P. Wilcock and R. Iverson, American Geophysical Union, pp. 63-79.

18. Snyder*, N.P., Whipple, K.X., **Tucker, G.E.**, and Merritts, D.J. (2003) Channel response to tectonic forcing: field analysis of stream morphology and hydrology in the Mendocino triple junction region, northern California. *Geomorphology*, v. 53, p. 97-127.
17. Snyder*, N.P., Whipple, K.X., **Tucker, G.E.**, and Merritts, D.J. (2003) The importance of a stochastic distribution of floods and erosion thresholds in the bedrock river incision problem. *Journal of Geophysical Research*, v. 108, no. B2, doi:10.1029/2001JB001655.
16. **Tucker, G.E.**, and Whipple, K.X. (2002) Topographic outcomes predicted by stream erosion models: Sensitivity analysis and intermodel comparison. *Journal of Geophysical Research*, v. 107, no. B9, 2179, doi:10.1029/2001JB000162.
15. Snyder*, N.P., Whipple, K.X., **Tucker, G.E.**, and Merritts, D.J. (2002) Interactions between onshore bedrock-channel incision and near-shore wave base erosion forced by eustasy and tectonics. *Basin Research*, v. 14, p. 105-127.
14. Whipple, K.X., and **Tucker, G.E.** (2002) Implications of sediment-flux dependent river incision models for landscape evolution. *Journal of Geophysical Research*, v. 107, no. B2, doi:10.1029/2000JB000044.
13. **Tucker, G.E.**, Catani, F., Rinaldo, A., and Bras, R.L. (2001) Statistical analysis of drainage density from digital terrain data. *Geomorphology*, v. 36, no. 3-4, p. 187-202.
12. **Tucker, G.E.**, Lancaster, S.T., Gasparini*, N.M., and Bras, R.L. (2001) The Channel-Hillslope Integrated Landscape Development (CHILD) Model. In: *Landscape Erosion and Evolution Modeling*, edited by R.S. Harmon and W.W. Doe III, Kluwer Academic/Plenum Publishers, pp. 349-388.
11. **Tucker, G.E.**, Lancaster, S.T., Gasparini*, N.M., Bras, R.L., and Rybarczyk*, S.M. (2001) An object-oriented framework for hydrologic and geomorphic modeling using triangulated irregular networks. *Computers and Geosciences*, v. 27, no. 8, p. 959-973.
10. Niemann*, J.D., Gasparini*, N.M., **Tucker, G.E.**, and Bras, R.L. (2001) A quantitative evaluation of Playfair's Law and its use in testing long-term stream erosion models. *Earth Surface Processes and Landforms*, v. 26, p. 1317-1332.
9. Schlunegger, F., Melzer, J., and **Tucker, G.E.** (2001) Climate, exposed source-rock lithologies, crustal uplift and surface erosion: A theoretical analysis calibrated with data from the Alps/North Alpine foreland basin system. *International Journal of Earth Sciences*, v. 90, no. 3, p. 484-499.
8. **Tucker, G.E.**, and Bras, R.L. (2000) A stochastic approach to modeling the role of rainfall variability in drainage basin evolution. *Water Resources Research*, v. 36, no. 7, p. 1953-1964.
7. Snyder*, N.P., Whipple, K.X., **Tucker, G.E.**, and Merritts, D. (2000) Landscape response to tectonic forcing: DEM analysis of stream profiles in the Mendocino triple junction region, northern California. *Geological Society of America Bulletin*, v. 112, no. 8, p. 1250-1263.
6. Gasparini*, N.M., **Tucker, G.E.**, and Bras, R.L. (1999) Downstream fining through selective particle sorting in an equilibrium drainage network. *Geology*, v. 27, p. 1079-1082.
5. Whipple, K.X., and **Tucker, G.E.** (1999) Dynamics of the stream power river incision model: implications for height limits of mountain ranges, landscape response timescales and research needs. *Journal of Geophysical Research*, v. 104, p. 17,661-17,674.
4. **Tucker, G.E.**, and Bras, R.L. (1998) Hillslope processes, drainage density, and landscape morphology. *Water Resources Research*, v. 34, p. 2751-2764.
3. **Tucker, G.E.**, and Slingerland, R.L. (1997) Drainage basin responses to climate change. *Water Resources Research*, v. 33, p. 2031-2047.
2. **Tucker, G.E.**, and Slingerland, R.L. (1996) Predicting sediment flux from fold and thrust belts. *Basin Research*, v. 8, p. 329-349.
1. **Tucker, G.E.**, and Slingerland, R.L. (1994) Erosional dynamics, flexural isostasy, and long-lived escarpments. *Journal of Geophysical Research*, v. 99, p. 12,229-12,243.

Publications: non-refereed conference proceedings, technical reports, field guides, and other

- Tucker, G.E.** (2010) A Short Introduction to Landscape Evolution Modeling. Short course notes, available online via Community Surface Dynamics Modeling System (<http://csdms.colorado.edu>; distributed with CHILD software), 22pp.
- Syvitski, J.P.M., Slingerland, R.L., Burgess, P., Meiburg, E., Murray, A.B., Wieberg, P., **Tucker, G.E.**, and Voinov, A. (2009) Morphodynamic models: an overview. In: Vionnet, C., Garcia, M.H., Latrubesse, E.M., Perillo, G.M.E., *River, Coastal and Estuarine Morphodynamics: RCEM 2009*, CRC Press.
- Tucker, G.E.** (2008) CHILD Users' Guide. Documentation distributed online with CHILD software, 47pp.
- Tucker, G.E.**, and Bradley*, D.N. (2008) Analysis and Modeling of Complex Geomorphic Systems: Technique Development, Data Collection, and Application to Rangeland Terrain. Final project report prepared for U.S. Army Research Office, 87pp.
- Clevis, Q., **Tucker, G.E.**, Lock, G., and Desitter, A. (2004) *Modelling the Stratigraphy and Geoarchaeology of English Valley Systems*. Technical report prepared for English Heritage, 14pp.
- Syvitski, J.P.M., **Tucker, G.**, Seber, D., Peckham, S., Seitzinger, S., Pfeffer, W.T., Voinov, A., Slingerland, R., and Goran, W. (2004) *Community Surface Dynamics Modeling System Implementation Plan*. White paper prepared for National Science Foundation, 61pp.
- Tucker, G.E.** (2004) Models in geomorphology, in *Encyclopedia of Geomorphology*, edited by A. Goudie, Routledge.
- Tucker, G.E.** (2004) Interfluves, in *Encyclopedia of Geomorphology*, edited by A. Goudie, Routledge.
- Syvitski, J.P.M., Paola, C., Slingerland, R., Furbish, D., Wiberg, P., and **Tucker, G.** (2003) *Building a Community Surface Dynamics Modeling System: Rationale and Strategy; A Report from the Scientific Community to the National Science Foundation*. White paper prepared for National Science Foundation, 41pp.
- Tucker, G.E.**, Gasparini, N.M., and Bras, R.L. (2001) Modeling the 3D Stratigraphic Context of Prehistoric Sites: A New Approach Using Process-Based Computer Simulation, in Zeidler, J.A., ed., *Dynamic Modeling of Landscape Evolution and Archaeological Site Distributions: A Three-Dimensional Approach*, Center for Environmental Management of Military Lands Technical Report CEMML TPS 01-8, p. 16-28.
- Tucker, G.E.** (2000) Escarpments, in Hancock, P.L., and Skinner, B.J., *The Oxford Companion to the Earth*, Oxford University Press, p. 320-321.
- Tucker, G.E.**, Gasparini, N.M., Bras, R.L., and Lancaster, S.L. (1999) *A 3D Computer Simulation Model of Drainage Basin and Floodplain Evolution: Theory and Applications*, Technical report prepared for U.S. Army Corps of Engineers Construction Engineering Research Laboratory, 374pp.
- Tucker, G.E.**, Gasparini, N.M., Lancaster, S.T., and Bras, R.L. (1997) *An Integrated Hillslope and Channel Evolution Model as an Investigation and Prediction Tool*, Technical Report prepared for U.S. Army Corps of Engineers Construction Engineering Research Laboratories, 123pp.
- Duke, W.L., Pazzaglia, F.J., Gibbs, M.T., Hayes, K.R., and **Tucker, G.E.** (1992) Rhythmically Spaced Reactivation Surfaces in Cross-bedded Sand Bodies of the Pensauken Formation Indicate a Shallow Subtidal Setting, in F. J. Pazzaglia and T. W. Gardner, eds., *Tectonic Geomorphology and Late Cenozoic Geology of the Lower Susquehanna River Basin*: Geological Society of America Field Trip Guidebook, Penn State University, University Park, PA, p. A1-A4.

CONFERENCE PRESENTATIONS (2011 – 2012)

- Anderson, S.P., Anderson, R.S., Kelly*, P.J., **Tucker, G.E.**, and Wickert*, A. (2012) Frost weathering: climate control of regolith production and critical zone evolution. Paper presented at European Geosciences Union annual meeting, Vienna, April 2012.

- Duvall^{**}, A.R., and **Tucker, G.E.** (2012) Tracing the geomorphic signature of lateral faulting. Paper presented at American Geophysical Union fall meeting, San Francisco, December 2012.
- Godard, V., **Tucker, G.E.**, Fisher, B., Burbank, D., and Bookhagen, B. (2012) Frequency-dependent response of landscapes to climatic forcings. Paper presented at American Geophysical Union fall meeting, San Francisco, December 2012.
- Kean, J.W., McCoy^{*}, S.W., Staley, D.M., Coe, J.A., Leeper, R., and **Tucker, G.E.** (2012) A hacker's guide to catching a debris flow: lessons learned from four years of chasing mud in Colorado and southern California. Paper presented at American Geophysical Union fall meeting, San Francisco, December 2012.
- Kean, J.W., McCoy^{*}, S.W., **Tucker, G.E.**, Staley, D.M., and Coe, J.A. (2012) Investigating controls on debris-flow initiation at Chalk Cliffs, USA: initial results from monitoring and modeling. Paper presented at European Geosciences Union annual meeting, Vienna, April 2012.
- Langston^{*}, A., **Tucker, G.E.**, Anderson, R.S., and Anderson, S.P. (2012) Turning rock into saprolite: linking observations and models of vadose zone dynamics and chemical weathering. Paper presented at American Geophysical Union Hydrology Days, Fort Collins, March 2012.
- Langston^{*}, A., **Tucker, G.E.**, Anderson, R.S., Foster^{*}, M.A., and Anderson, S.P. (2012) Interpreting climate-driven aggradation and incision along the fringes of a decaying mountain range. Paper presented at American Geophysical Union fall meeting, San Francisco, December 2012.
- McCoy^{*}, S.W., **Tucker, G.E.**, Kean, J.W., and Coe, J.A. (2012) Granular mechanics of debris-flow incision: measuring and modeling grain-scale impact forces. Paper presented at American Geophysical Union fall meeting, San Francisco, December 2012.
- Perignon^{*}, M.C., **Tucker, G.E.**, Griffin, E.R., and Friedman, J.M. (2012) Using repeat lidar imagery to measure topographic change produced by a large flood event on the Rio Puerco, New Mexico. Paper presented at Rocky Mountain Hydrologic Research Center annual meeting, Fort Collins, October 2012.
- Perignon^{*}, M.C., **Tucker, G.E.**, Griffin, E.R., and Friedman, J.M. (2012) Effects of riparian vegetation on topographic change during a large flood event, Rio Puerco, New Mexico. Paper presented at American Geophysical Union fall meeting, San Francisco, December 2012.
- Rengers^{*}, F.K., and **Tucker, G.E.** (2012) Headcut erosion mechanics in gully systems. Paper presented at Geological Society of American annual meeting, Charlotte, October 2012.
- Rengers^{*}, F.K., **Tucker, G.E.**, and Moody, J.A. (2012) Quantifying post-wildfire erosion patterns using terrestrial LiDAR. Paper presented at American Geophysical Union fall meeting, San Francisco, December 2012.
- Roy^{*}, S.G., Koons, P.O., **Tucker, G.E.**, and Upton, P. (2012) The influence of tectonic strain on geomorphic metrics. Paper presented at American Geophysical Union fall meeting, San Francisco, December 2012.
- Staley, D.M., Waskelwicz, T.A., Coe, J.A., Kean, J.W., McCoy^{*}, S.W., and **Tucker, G.E.** (2012) Geomorphic change detection at the Chalk Cliffs natural debris-flow laboratory using multi-temporal terrestrial laser scanning data. Paper presented at Geological Society of American annual meeting, Charlotte, October 2012.
- Tucker, G.E.** (2012) Hillslope, mountain, and river: some surprises in landscape evolution. Ralph Alger Bagnold Medal Lecture, European Geosciences Union annual meeting, Vienna, April 2012.
- Anderson, R. S., Anderson, S.P., and **Tucker, G.E.** (2011) Of damage zones, reactors and conveyor belts: A geomorphologist's view of the long term evolution of the critical zone. Paper presented at Critical Zone Observatories annual meeting, Biosphere2, Arizona.
- Anderson, R.S., Anderson, S.P., and **Tucker, G.E.** (2011) Of rock damage and the regolith conveyor belt: a geomorphologist's view of the critical zone. Paper presented at American Geophysical Union Fall meeting, December 2011.
- Anderson, S.P., **Tucker, G.E.**, Anderson, R.S., Langston^{*}, A., and Kelly^{*}, P. (2011) Rock into regolith: Earth's critical zone. Paper presented at Chapman Conference summer 2011, Galapagos.

- Coe, J.A., McCoy*, S.W., Kean, J.W., and **Tucker, G.E.** (2011) High-resolution measurements of sediment entrainment by a natural debris flow. Paper presented at American Geophysical Union Fall meeting, December 2011.
- Cowie, P.A., Attal, M., Finch*, E., Gawthorpe, R., Whittaker, A.C., **Tucker, G.E.**, and Roberts, G.P. (2011) Controls on sediment supply from relay zone catchments along extensional fault systems and the implications for rift basin stratigraphy. Paper presented at Geological Society of American annual meeting, October 2011.
- Kean, J.W., Coe, J.A., McCoy*, S.W., **Tucker, G.E.**, Staley, D.M., and Waskelwicz, T.A. (2011) Monitoring debris-flow initiation processes at Chalk Cliffs, Colorado, USA. Paper presented at Geological Society of American annual meeting, October 2011.
- Kean, J.W., McCoy*, S.W., and **Tucker, G.E.** (2011) On the similarity in shape between debris-flow channels and high-gradient flood channels: insight from continuum models for granular and water flow. Paper presented at American Geophysical Union Fall meeting, December 2011.
- Langston*, A.L., **Tucker, G.E.**, Anderson, R.S., and Anderson, S.P. (2011) Exploring fracture-dominated flow and spatially variable chemical weathering in the Boulder Creek Critical Zone Observatory, Colorado, USA. Paper presented at Goldschmidt Conference, August 2011.
- Langston*, A.L., **Tucker, G.E.**, Anderson, R.S., and Anderson, S.P. (2011) Exploring links between hydrology and chemical weathering in the Boulder Creek Critical Zone Observatory. Paper presented at Geochemistry of the Earth's Surface, June 2011.
- Langston*, A.L., **Tucker, G.E.**, Anderson, R.S., and Anderson, S.P. (2011) Turning rock into saprolite: Linking observations and models of vadose zone dynamics and chemical weathering. Paper presented at American Geophysical Union Fall meeting, December 2011.
- McCoy*, S.W. and **Tucker, G.E.** (2011) Controls on the erosional efficiency of granular flows. Paper presented at American Geophysical Union Fall meeting, December 2011.
- Mosley Jr.***, B., Rengers*, F.K., and **Tucker, G.E.** (2011) Factors controlling infiltration rates in a semi-arid landscape. Paper presented at Geological Society of American annual meeting, October 2011.
- Perignon*, M.C., **Tucker, G.E.**, Griffin, E.R., Friedman, J.M., and Vincent, K.R. (2011) Predicting the effects of floodplain vegetation on patterns of sediment deposition using a morphodynamics landscape evolution model. Paper presented at Geological Society of American annual meeting, October 2011.
- Perignon*, M.C., **Tucker, G.E.**, van der Beek, P., Hilley, G.E., and Arrowsmith, R. (2011) Using neighborhood algorithm inversion to test and calibrate landscape evolution models. Paper presented at American Geophysical Union Fall meeting, December 2011.
- Rengers*, F.K. and **Tucker G.E.** (2011) Integrating field measurements and numerical modeling to investigate gully network evolution. Paper presented at American Geophysical Union Fall meeting, December 2011.
- Rengers*, F.K., **Tucker G.E.**, Phillips, D.A., and Okal, M. (2011) Exploring knickpoint retreat mechanics with repeat terrestrial lidar scans. Paper presented at Geological Society of American annual meeting, October 2011.
- Tucker, G.E.**, McCoy*, S.W., Whittaker, A.C., Roberts, G.P., Lancaster, S.T., and Phillips, R. (2011) Climate change and mountain-front morphology: Estimating Late Glacial to Holocene erosion rates from the shape of fault-bounded hillslopes. Paper presented at American Geophysical Union Fall meeting, December 2011.
- Tucker, G.E.**, van der Beek, P., Langston*, A., Anderson, R.S., and Anderson, S.P. (2011) Critical Zones and Decaying Mountains: A Simple Model for Post-Orogenic Landscape Evolution of a Range and its Adjacent Basin. Paper presented at Critical Zone Observatories annual meeting, Biosphere2, Arizona.
- van der Beek, P., and **Tucker, G.E.** (2011) A simple model for the post-orogenic evolution of mountain ranges and foreland basins. Paper presented at American Geophysical Union Fall meeting, December 2011.

RESEARCH GRANTS

(% indicates approximate fraction for which GT is directly responsible on collaborative grants)

Current Support

Collaborative Research: SI2-SSE: Component-Based Software Architecture for Computational Landscape Modeling. U.S. National Science Foundation OCI Program, PI: G. Tucker, 2012-2015, \$224,124 (100%).

Shaking hills and twisted rivers: Tracing the fingerprints of earthquakes past and present in New Zealand's Marlborough Hill Country. National Geographic Society, PI: A. Duvall with co-investigator G. Tucker, 2012-2013, \$22,465 (~30%).

Boulder Creek CZO Renewal: Weathered Profile Development in a Rocky Environment and Its Influence on Watershed Hydrology and Biogeochemistry. U.S. National Science Foundation EAR Division, PI: S. Anderson with co-investigators R. Anderson, N. Molotch, H. Rajaram, and G. Tucker, 2012-2013, \$1,000,000 (~20%).

EarthCube Domain End-User Workshop: Engaging the Critical Zone community to bridge long tail science with big data. U.S. National Science Foundation, PI: A. Aufdenkampe with co-investigators C. Duffy and G. Tucker, 2012-2013, \$99,922 (funding to University of Delaware for workshop support).

From Peaks to Prairie: Two Natural Experiments in Decadal Landscape Evolution. U.S. National Science Foundation EAR Geomorphology and Land-use Dynamics Program, PI: G. Tucker, 2010-2013, \$299,720 (100%).

Past Support

CZO: Boulder Creek Critical Zone Observatory – Weathered Profile Development in a Rocky Environment and Its Influence on Watershed Hydrology and Biogeochemistry. U.S. National Science Foundation EAR Division, PI: S. Anderson with co-investigators R. Anderson, N. Fierer, A. Sheehan, and G. Tucker, 2007-2012, \$4,249,997 (~20%).

RAPID: Collecting Field Data in Support of LiDAR Acquisition during Maximum Snow Conditions and Maximum Leaf Out in the Boulder Creek Critical Zone Observatory. U.S. National Science Foundation, PI: S. Anderson with co-investigators N. Molotch and G. Tucker, 4/15/10-4/14/11, \$33,150.

CMG Research: Modeling River Basin Dynamics; Parallel Computing and Advanced Numerical Methods. U.S. National Science Foundation Collaborations in Mathematical Geoscience Program, PI: S. Peckham (Instaar) with co-investigators T. Manteuffel (CU Applied Math), S. McCormick (CU Applied Math), and G. Tucker, September, 2006 to August 2010, \$900,000 (21%).

Collaborative Research: The Role of Debris Flows in Shaping Mountainous Terrain. U.S. National Science Foundation EAR Geomorphology and Land-use Dynamics Program, PI: G. Tucker with external collaborator S. Lancaster (Oregon State) and CU collaborator A. Lester, 9/1/07-8/31/10, \$147,583 (100%).

SGER: Imaging a Natural Experiment in Drainage Divide Migration. U.S. National Science Foundation EAR Small Grants for Exploratory Research Program, PI: G. Tucker, September 2006 to August 2007, \$4,948 plus high-resolution, research-grade laser altimetry data obtained for a study site east of Denver.

Collaborative Research: Erosional Forcing of Late Quaternary Compressive Strain, West Central Taiwan. U.S. National Science Foundation EAR Tectonics Program, PI: K. Mueller (CU Geological Sciences) with co-investigator G. Tucker and external collaborator P. Upton (Univ. Maine), August 2005 to July 2009 – \$268,700 (37%).

Analysis and Modeling of Complex Geomorphic Systems: Technique Development, Data Collection, and Application to Rangeland Terrain. U.S. Army Research Office, PI: G. Tucker, August 2004 to July 2008, \$299,106.

Modelling the Stratigraphy, Geoarchaeology, and Aggregate Resources of English Valley Systems. English Heritage, PI: G. Tucker with co-investigator G. Lock (Univ. Oxford), January 2003 to March 2004, £73,000 (75%).

Modeling the Dynamics of Gully and Arroyo Development: Fort Carson and Pinon Canyon Maneuver Site, Colorado. U.S. Army Research Office, PI: G. Tucker, June 2001 to May 2004, \$200,000.

INVITED COLLOQUIA

University of Wyoming, Department of Geology and Geophysics, October 2012
University of Colorado, Department of Geological Sciences, September 2012
European Geophysical Union, Ralph Alger Bagnold Lecture, April 2012
University of Colorado, Hydrosiences Seminar, April 2012
GNS Science, Lower Hutt, New Zealand, February 2012
University of Kansas, Department of Geography, November 2011
University of Colorado, Department of Geological Sciences, August 2011
Institute for Arctic and Alpine Research, February 2011
ETH Zürich, Switzerland, December 2010
Centre de Recherches Pétrographiques et Géochimiques, Nancy, France, December 2010
Université Joseph Fourier, ISTERre, Grenoble, France, November 2010
Cemagref, Grenoble, France, November 2010
University of New Mexico, Department of Earth and Planetary Sciences, October 2009
University of Colorado, Water Sciences Seminar, September 2009
University of Wyoming, Department of Geology and Geophysics, December 2007
University of Colorado, Department of Applied Mathematics, November 2007
Geological Society of London, Bicentennial Conference, September 2007
University of Calgary, Department of Biological Sciences, April 2007
University of Minnesota, St. Anthony Falls Hydraulics Laboratory, March 2006
Colorado State University, Department of Geological Sciences, April 2005
University of Colorado, Department of Civil, Environmental and Architectural Engineering, March 2005
University of Colorado, Department of Geography, February 2005
University of Cincinnati, Department of Geology, October 2004
University of Colorado, INSTAAR, April 2004
University of Cambridge, Department of Earth Sciences, November 2003
Vrije Universiteit Amsterdam, Department of Geography, March 2003
ETH Zürich, Institute of Hydromechanics and Water Resources, February 2003
University of Zürich, Department of Geography, February 2003
University of Leeds, School of Geography, February 2003
University of Bristol, School of Geographical Sciences, November 2002
University of Cambridge, Institute for Theoretical Geophysics, October 2002
University of Oxford, Institute of Archaeology, March 2002
University of Sheffield, Department of Geography, March 2002
Géosciences Rennes, France, December 2001
University of St. Andrews, School of Geography and Geosciences, October 2001
Yale University, Department of Geology and Geophysics, April 2001
Imperial College London, Department of Earth Sciences, February 2001
University of Edinburgh, Department of Geography, February 2001
University of Glasgow, Department of Geography and Topographic Science, February 2001
Kings College London, Department of Geography, November 2000
University of Southampton, Department of Geography, November 2000
University of Oxford, Department of Earth Sciences, October 2000
University of Oxford, Oxford Centre for Industrial and Applied Mathematics, July 2000
Massachusetts Institute of Technology, Earth Resources Laboratory, October 1999
Cornell University, Department of Geological Sciences, January 1997

TEACHING ACTIVITIES

Courses Taught

The Fluid Earth (Upper-level undergraduate course, CU, 2008–present)
Sediment Transport Mechanics (Graduate course, CU, 2006–present)
Geomorphology Seminar (Graduate reading seminar, CU, 2005–present)
Modeling Landscapes (Graduate/undergraduate course, CU, 2005–present)
Introduction to Physical Geology (Introductory undergraduate lecture course, CU, 2004–present)
Advanced Geomorphology (Graduate course co-taught with R. Anderson, CU, 2007)
Seminar in Landscape Evolution (Combined graduate-undergraduate seminar, CU, 2004)
Environmental Modelling (Interdisciplinary M.Sc. course, Oxford, 2000–2003)
Undergraduate tutorial teaching in various topics in first-year *Physical Geography* (Oxford, 2000–2003)
Fluvial and Tectonic Geomorphology (M.Sc. course, Oxford, 2002)
River Basin Dynamics (Upper-level undergraduate course, Oxford, 2001)
GIS in Terrain Analysis (Undergraduate and M.Sc. short course, Oxford, 2000–2001)
Introduction to Hydrology (Upper-level undergraduate course, MIT, 1998)
Process-Response Models of River Basin Evolution (Short course, Perugia, Italy, June 1998)

Post-Doctoral Scholars Supervised

Dr. Daniel Hopley, 2013-present
Dr. Brian Ebel (CIRES Visiting Fellow), 2012-present
Dr. Alison Duvall (CIRES Visiting Fellow), 2011-2012
Dr. Cameron W. Wobus (CIRES Visiting Fellow), 2005-2009
Dr. Quintijn Clevis, 2003-2004

Graduate Students Supervised

Current: Mariela Perignon (Ph.D.); Abigail Langston (Ph.D.); Francis Rengers (Ph.D.)

Graduated: Scott McCoy (Ph.D., 2012); D. Nathan Bradley (Ph.D., 2010); Brian Yanites (Ph.D., 2009); Lee Arnold (D.Phil., 2006); Peter Sólyom (D.Phil., 2005); Parris Lyew-Ayee (D.Phil., 2004); Clare Winter (M.Sc., 2002); Michael Heslop (M.Sc., 2001); Tumbikanani Mtika (M.Sc., 2001)

Graduate Student Committees (2007 – present)

Doctoral: Leif Anderson, David Bedford, Katherine Barnhart, Monica Hoke, Ulyana Horodyskyj, Benjamin Hudson, Maureen Mason, Erich Mueller, Evan Pugh, Philippe Steer (École Normale Supérieure, Paris, France), Dylan Ward, Andrew Wickert, Tarka Wilcox, Fei Xing
Masters: Kali Abel, Kenneth Babcock, Daniel Fernandez, Cody Flagg, Pamela Grothe, Shahen Huda, Katherine Kahn

PROFESSIONAL SERVICE

National / International

Chair of Terrestrial Working Group (440 members) and Member of Executive Committee, Community Surface Dynamics Modeling System (CSDMS), 2007-present
Associate Editor, *Journal of Geophysical Research – Earth Surface*, 2007-2009
Member of Editorial Board, *Earth Surface Processes and Landforms*, 2004-present
Member of Executive Committee, Boulder Creek Critical Zone Observatory, 2007-present
Member, European Geophysical Union Ralph Alger Bagnold Medal Committee, 2012-present
Developer and co-developer (respectively) of GOLEM and CHILD landscape evolution models.
Lecturer, National Center for Earth-Surface Dynamics Summer Institute, 2012
Co-convener, American Geophysical Union special session on *Debris Flows: From Hazard Mitigation to Landscape Evolution*, AGU Fall meeting, December, 2011
Co-convener, American Geophysical Union special session on *Computational Modeling of Landscapes and*

Seascapes, AGU Fall meeting, December, 2009
 Co-convenor, American Geophysical Union special session on *Geomorphic Impacts of Global Change*, AGU Fall meeting, December, 2006
 Co-convenor, American Geophysical Union special session on *Impacts of Hydrology on Landscape Evolution*, AGU Fall meeting, December, 2005
 Co-convenor, American Geophysical Union special session on *Testing Models of Drainage Basin Geomorphology*, AGU Fall meeting, December, 1999
 Co-convenor, American Geophysical Union special session on *Hillslope and Fluvial Processes*, AGU Spring meeting, June, 1999
 Co-convenor, American Geophysical Union special session on *Geomorphic Responses to Environmental Change*, AGU Spring meeting, June, 1998
 Co-convenor, American Association of Petroleum Geologists special session on *Surface Processes and Neotectonics*, AAPG-SEPM annual meeting, May, 1998
 Peer reviewer for national and international journals and book publishers, including (2004-present): *Arctic, Antarctic, and Alpine Research; Basin Research; Computers and Geosciences; Earth Surface Processes and Landforms; Geografia Fisica e Dinamica Quaternaria; Geology; Geological Society of America Bulletin; Geomorphology; Geophysical Research Letters; Geosphere; Hydrological Processes; Journal of Geophysical Research; Nature Geoscience; Quaternary International; Quaternary Research; SIAM Journal on Applied Mathematics; Water Resources Research.*
 Peer reviewer for funding agencies: *U.K. Natural Environment Research Council, U.S. Army Research Office, U.S. National Science Foundation, and ACS Petroleum Research Fund.*

University Service (2007 – present)

Cooperative Institute for Research in Environmental Sciences (CIRES)

2012-13	Chair, Career-Track Committee
2011-12	Member, Career-Track Committee
2007-9	Member, Career-Track Committee
2006-9	Member, Executive Committee
2006-7	Member, New Fellows Committee

Department of Geological Sciences

2011-13	Chair, Graduate Admissions/Aid Committee
2011-12	Member, Analytical Facilities Committee
2007-9	Chair, Graduate Student Interview Committee
2006-7	Co-Chair, Graduate Admissions/Aid Committee
2006-7	Member, Ad Hoc Space Committee

University of Colorado

2012-13	Member, Arts and Sciences Council
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Community and Outreach

“Mountain, glacier and gully: tales of an evolving landscape.” Public presentation, Café Scientifique, Denver, Colorado, July 2012.

Field trip leader, Plains Conservation Center Trailblazers program, August 2012.