



Dr. Benjamin T. Crosby
 crosby@isu.edu
 208-282-2949

Idaho State University
 Department of Geosciences
 Campus Box 8072
 Pocatello, ID 83209-8072

Research Interests and Skills

I am fascinated by the physical processes through which the Earth’s surface responds to climatic, tectonic and anthropogenic disturbance. I enjoy exploring the rate and form of landscape adjustment (rivers, hillslopes, and coastlines) and the biotic consequences of this adjustment over both human and geologic timescales. To accomplish these tasks, I utilize data from field observations, numerical modeling, digital topographic analysis, physical experimentation and remote sensing. Strong collaborative ties with terrestrial, riparian and aquatic ecologists, hydrologists and biogeochemists have enabled me to study Arctic and Temperate ecosystem sensitivity to changes in climate and land management.

Professional Preparation

University of California at Berkeley	Geology (with honors)	B.A.	1999
Massachusetts Institute of Technology	Geology/Geomorphology	Ph.D.	2006

Appointments

Associate Professor, Dept. of Geosciences, Idaho State University	(2012-)
Fulbright Scholar, Dept. of Civil Engineering, Universidad de Concepción, Chile	(2013-2014)
Hydrology Chair for Arctic Landscape Conservation Cooperative, USGS	(2011-2012)
Assistant Professor, Dept. of Geosciences, Idaho State University	(2006-2012)
Research Assistant, Dept. of Earth, Atmospheric and Planetary Sciences, MIT	(2003-2006)
Teaching Assistant, Dept. of Earth Sciences, Harvard University	(2003)
Teaching Assistant, Dept. of Earth, Atmospheric and Planetary Sciences, MIT	(2000-2003)
Exploration Geologist: Cominco Alaska, Red Dog Pb/Zn Mine	(1999-2000)
Geologic Curriculum Developer: National Parks Service, Kotzebue, Alaska	(1999-2000)
Geologic Curriculum Developer: FOSS Science, Lawrence Berkeley National Labs	(1997-1999)
Ug. Research Assistant, Alvarez Lab, Dept. of Earth and Planetary Science, UC Berkeley	(1996-1999)

Active Research Funding:

NSF; “A Field-Based Curriculum for Quantifying Deformation of the Earth’s Surface” \$90,000; Graduate supervision, National curriculum development, workshop leadership	(2016-2018)
DeVlieg Foundation; Research Grant, “Logjam Formation and Breakup, Big Creek, ID” \$60,000; Master’s Student Supervision	(2015-2017)
City of Pocatello; “Assessment of Sources of Suspended Sediment, Marsh Creek, ID” \$60,000; Graduate and undergraduate research supervision	(2015-2017)
NSF; “The Legacy of Transience: Understanding landscape adjustment following mountain uplift” \$161,555; Graduate/UG Student Supervision, Landscape evolution	(2014-2017)
NSF; EPSCoR Grant, “RII Track 1: Managing Idaho’s Landscapes for Ecosystem Services” \$200,000; Postdoc, Graduate and undergraduate research supervision, Curriculum development.	(2013-2019)
NSF; “Reynolds Creek Critical Zone Observatory” \$100,000; Graduate Student Supervision, Course development, Interdisciplinary	(2013-2017)

Previous Funding, Awards and Honors:

DeVlieg Foundation; Undergraduate Research Opps., “Large Wood in Big Creek, ID” \$5000; Undergraduate Research Supervision (Emmy Ray)	(2015)
Campbell Scientific, Inc; “IMAGINE Grant: Measurement Instrumentation for Education” ~\$38,000; Purchase of instrumentation to support new field/classroom curriculum	(2015)
NSF-CZO-SAVI Program; “How sensitive is aboveground biomass to snowpack loss?” \$5000; Travel for interdisciplinary work, expanding thesis of Chris Tennant	(2015)
Fulbright Scholar Program, “Taking the Pulse of Chilean Rivers: Teaching and Research” \$30,900; Sabbatical work at Universidad de Concepción, Chile	(2013-2014)
NSF/National Center for Airborne Laser Mapping (NCALM), “Green LiDAR in Big Creek, ID” ~\$30,000; Seed Award to Chris Tennant for acquisition of river bathymetry	(2013-2014)
DeVlieg Foundation; Ug. Research Opps. “Hydraulic scaling in tributaries to Big Creek, ID” \$5000; Undergraduate Thesis Supervision (Holly Young)	(2013-2014)
NASA IDSGC; “Bathymetric LiDAR and the topographic signature of disturbance in riverscapes”(2013-2014) \$17,500; Graduate student stipend and NASA travel funds. Chris Tennant	(2013-2014)
LANL - IGPP Grant, “Carbon-Cycle Dynamics Following Thaw Slumping, Selawik River, AK” \$120,685; Graduate Student Supervision, Geochem. Analysis, Interdisciplinary	(2010-2013)
NSF; EPSCoR Grant, “Water Resources in a Changing Climate” \$750,000; Post-Doc and Graduate Student Supervision, Interdisciplinary	(2008-2013)
NSF; OPP Grant, “Influence of Hillslope Instability (Thermokarst) on Arctic Landscapes” \$251,570; Graduate Student Supervision, Interdisciplinary	(2008-2013)
US Fish & Wildlife Service, “Selawik River Retrogressive Thaw Slump, Northwest, AK” \$192,000; Graduate student support, Water quality and quantity monitoring eqp.	(2009-2012)
USGS - Contracted as, “Chair of the Arctic LCC Hydrology Working Group” \$99,500; Academic Year Salary and Travel, Synthetic, Science Plan Development	(2011-2012)
State of Idaho: Division of Public Works, EPSCoR, “Flume Facility Renovation at ISU” \$348,400; Modernization and expansion of departmental flume facility	(2008-2012)
LANL - LDRD Award, Support for Field activities for Selawik River Science, AK \$15,000; Funding to cover logistic and science operations.	(2012)
NSF; EAR-IF Grant, Upgrade of Computing Equipment in the Digital Mapping Laboratory \$75,000; Purchase and installation of 24 workstations, 2 servers, Gigabit network	(2009-2010)
INRA - DOE, “Tools for Monitoring Arctic River Processes and Fluxes, Northwest, AK” \$40,000; Graduate student, monitoring equipment, travel	(2009-2011)
INRA – DOE, “INRA Water Resources Steering Committee” \$8,333; Support initial water resources research in the Salmon River	(2008-2010)
DeVlieg Foundation; Research Grant, “Topographic Control on Basin Hydrology, Big Creek, ID” \$40,000; Master’s Student Supervision	(2008-2010)
NASA, ID Space Grant Consort., “Lunar Volcanic Geomorph, Lithosphere Struct., Composition” \$60,710; Supervision of 2 Undergraduate Students, Travel to meetings	(2008-2009)
DeVlieg Foundation; Undergraduate Research Opps., “Suspended Sediments in Big Creek, ID” \$10,000; Undergraduate Thesis Supervision (E. Carlson and L. Junk)	(2008-2010)
Idaho State University; Undergraduate Research Grant: Fire and Sediment Production, Big Creek \$2,000; Undergraduate field and thesis supervision (Carlson)	(2008-2009)
DeVlieg Foundation; Visiting Professional Travel Grant: To Teach “Digital Tools” Workshop \$1000; Travel and Accommodation to Taylor Ranch to teach a Shortcourse	(2007)
Idaho State University; Faculty Research Grant: Arctic River Response to Climate Change \$5000; Funds to initiate research in Alaska and travel to present results	(2006-2007)
Idaho State University, Academic Computing Fund, Hardware upgrade Support of computer purchase	(2006)
NSF; Awarded distinction “Person of Excellence” for work done during GRF fellowship	(2006)
N.S.F. Graduate Research Fellowship (GRF)	(2000-2005)
N.S.F. Research Grant, “Knickpoint Migration: Processes, Rates and Form”	(2002-2005)
M.I.T. Departmental Award for ‘Excellence in Teaching’	(2004-2005)
M.I.T. Presidential Graduate Fellowship	(2000-2001)

MIT EAPS Research Grants: Enabled attendance of meetings / short courses outside thesis topic: (2002-2005)

- “The Physics and Predictability of Rainfall and Floods,” Aosta, Italy
- “Tectonics, Climate and Landscape Evolution,” Taroko, Taiwan
- “NSF-MARGINS Workshop on the Waipaoa River System,” New Zealand
- “Cryosphere / Hydrology / Climate processes,” Montreal, Canada
- “Arctic Climate & Terrestrial Ecosystems,” U.A.F., Fairbanks, AK
- “NCED conference on Mountain Rivers”
- “Hydrologic Responses to Degrading Permafrost,” U.A.F., AK

Thesis Research Grant: Northern California Geological Society (1998-1999)

McDonald Foundation: Academic Achievement Scholarship (1998-1999)

Graduate and Undergraduate Student Supervision

- *Graduate Thesis Advisor*

Nakul Deshpande, M.S. Geology

Log Jam formation and breakup, Big Creek, Idaho

Jimmy Guilinger, M.S. Geology

Appraising Sediment Sources and Remediation Strategies in Marsh Creek, Idaho

Chase Cusack, M.S. in Environmental Science and Mgt. (Engineering)

Analysis of historic turbidity fluctuations in a highly impacted stream, Marsh Creek, Idaho

Chris J. Tennant, Ph.D. in Geosciences, 2015

The Sensitivity of Mountain Snowpack to Warming

Amy Jensen, M.S. in Geology; 2013

Geomorphic and Biogeochemical Controls on Carbon Cycle Dynamics Following Thaw Slumping, Selawik River, Alaska

Theodore Barnhart, M.S. in Geology; 2013

Using High Frequency Terrestrial Lidar to Correlate Meteorological and Hydrological Drivers to the Growth of a Retrogressive Thaw Slump along the Selawik River, Alaska

Kelsey Lanan, M.S. in Geology; 2013

A Glacial and Geomorphic History of the Upper Selawik Valley, Northwest Alaska, with Implications for Thermokarst Formation

John (Pat) Calhoun, M.S. in Environmental Science and Mgt. (Engineering); 2012

Permafrost Degradation and River Metabolism: Downstream Effects of Retrogressive Thaw Slump Sedimentation on Ecosystem Metabolism in the Selawik River, Alaska

Kacy Krieger, M.S. in Geology; M.S.; 2012

The Topographic Form and Evolution of Thermal Erosion Features: A First Analysis Using Airborne and Ground-Based LiDAR in Arctic Alaska

Chris J. Tennant, M.S. in Geology; 2011

The Influence of Precipitation Phase and Hypsometry on Hydrograph Form: An Analysis of 12 Tributaries across the Rain-to-Snow Transition in the Salmon River, Idaho

Brad J. Gamett, M.S. in Geographic Information Science; 2010

An Accuracy Assessment of Digital Elevation Data and Subsequent Hydrologic Delineations in Low Relief Terrain: An Analysis for Idaho's Little Lost River Valley

Linda Tedrow, M.S. in Geographic Information Science; 2010

Mobile GIS Tools for Stream Assessment

Kelly Whitehead, M.S. in Geology; 2010

Spatial Analysis of Topographic and Geologic Controls on Hillslope Stability in the Ridge Basin Area, Northwest Los Angeles County

Neil F. Olson, M.S. in Geology; 2010

Hydrology of Big Creek, Idaho: Spatial and Temporal Heterogeneity of Runoff in a Snow-Dominated Wilderness Mountain Watershed

- *Graduate Thesis Committee Member*

Alex Rozin	Ph.D. candidate in Geosciences
Caitlin Rushlow	Ph.D. candidate in Geosciences
Julia Larouche	Ph.D. in Natural Resources, Univ. of Vermont, 2015
Danny Anderson	Ph.D. in Engineering and Applied Science, 2012
Ryan Bellmore	Ph.D. in Biology (Stream Ecology Lab), 2011
Joseph Benjamin	Ph.D. in Biology (Stream Ecology Lab), 2010
Madeleine Mineau	Ph.D. in Biology (Stream Ecology Lab), 2010
Heather Bechtold	Ph.D. in Biology (Stream Ecology Lab), 2010
Harrison Colandrea	M.S. in Geology, 2016
Nick Patton	M.S. in Geology, 2016
Maegan Tracy	M.S. in Anthropology, 2015
Lisa Leedham	M.S. as Physician's Assistant (GFR)
Troy Berry	M.S. in Environmental Science and Mgt. (Engineering), 2014
Kerry Riley	M.S. in Geology, Boise State University, 2012
Michael Frey	M.S. in Geographic Information Science, 2012
Jayson Murgotio	M.S. in Geographic Information Science, 2012
Hazel Reynolds	M.S. in Geology, 2011
Melissa Foster	M.S. in Geology, Humboldt State Univ., CA, 2010
Elijah Eversole	M.S. in Geology, 2008
Caleb Stroup	M.S. in Geology, 2008
Nathanial Arave	M.S. in Geographic Information Science, 2008
Eric Rafn	M.S. in Geographic Information Science, 2007
Ryan Blackadar	M.S. in Biology, (Stream Ecology Lab), 2013
Hannah Harris	M.S. in Biology, (Stream Ecology Lab), 2013
Javan Bauder	M.S. in Biology, 2010
Heidi Albano	M.S. in Biology, 2010
Sarah Schoen	M.S. in Biology, 2008

- *Undergraduate Thesis/Research Supervision*

Ian Lauer; B.S. EES, 2016, Flume design and installation. Instrumentation cart development
 Michael Martin; B.S. EES, 2016, Quantifying Marsh Creek Sediment Character and Flux.
 Mason Wegert B.S. Mechanical Engineering, 2018, Development of tools for analysis of water quality data.
 Jeff Nichols; B.S. Geology, 2017, Quantifying Marsh Creek Sediment Character and Flux.
 Kyle O'Keef; B.S. Geology (UCSB), 2016, LiDAR analysis of risk and hydrology in Grand Teton NP, WY
 Tisha Farris; B.S. EES (John's Hopkins), 2014, Measurements toward a Water Balance in Gibson Jack Ck., ID
 Emmy Hamilton; B.S. EES, 2016, Census and Character of Avalanche Delivered Wood to Mountain Channels
 Holly Young; B.S. Geology, 2014, Scaling Relations in Channel Geometry in Tributaries to Big Creek, ID.
 Christopher Lile, B.S. Geology, 2013, RFID Bedload Tracking across a Climate Gradient, Central Idaho.
 Aaron Trevino; B.S. Geology, 2011, Tracking Bedload Transport Using RFID Tags; When does what move?
 Liam Junk; B.S. EES, 2010, Temporal and Spatial Variation in Suspended Sediment in Big Creek, ID
 Eric Carlson; B.A. Geology, 2009, Sediment Delivery After Wildfire: Does Big Creek Feel the Burn?
 Kacy Krieger; B.S. Geology 2008, Reconstructing an incised landscape using imagery and GIS, Waipaoa, NZ

Publications: Peer-Reviewed

2015

- Pelletier, J.D., Murray, A.B., Pierce, J.L., Bierman, P.R., Breshears, D.D., Crosby, B.T., Ellis, M., Foufoula-Georgiou, E., Heimsath, A.M., Houser, C., Lancaster, N., Marani, M., Merritts, D.J., Moore, L.J., Pederson, J.L., Poulos, M.J., Rittenour, T.M., Rowland, J.C., Ruggiero, P., Ward, D.J., Whipple, K.X., Wickert, A.D., Yager, E.M., 2015, Forecasting the response of Earth's surface to future climatic and land-use changes: A review of methods and research needs. *Earth's Future*, vol. 3, no. 7, pp. 220-251, DOI: 10.1002/2014EF000290
- Tennant, C.J., Crosby, B.T., Godsey, S.E., VanKirk, R.W., Derryberry, D.R., 2015, A simple framework for assessing the sensitivity of mountain watersheds to snowpack loss, *Geophysical Research Letters*, vol. 42, no. 8, pp. 2814-2822, DOI: 10.1002/2015GL063413
- Tennant, C.J., Crosby, B.T. and Godsey, S.E. 2015, Elevation-dependent responses of streamflow to climate warming, *Hydrological Processes*, vol. 29, pp. 991-1001, DOI: 10.1002/hyp.10203

2014

- Bierman, P.R., Corbett, L., Graly, J.A., Neumann, T., Lini, A., Crosby, B.T., Rood, D., 2014, Preservation of a pre-glacial landscape under the center of the Greenland Ice Sheet, *Science*, vol. 344, no. 6182, pp 402-405, DOI: 10.1126/science.1249047
- Link, P.K., Crosby, B.T., Lifton, Z.M., Eversole, E.A., Rittenour, T.M., 2014, The Late Pleistocene (17 ka) Solder Bar Landslide and Big Creek Lake, Frank Church-River of No Return Wilderness, Central Idaho. *Rocky Mountain Geology*, vol. 49, no. 1, pp. 17-31, DOI: 10.2113/gsrocky.49.1.17
- Jensen, A.E., Lohse, K.A., Crosby, B.T., and Mora, C.I., 2014, Variations in soil carbon dioxide efflux across a thaw slump chronosequence in northwestern Alaska, *Environmental Research Letters*, 9:025001, 11p. doi:10.1088/1748-9326/9/2/025001.
- Tang, C., Chen, D., Crosby, B.T., Piechota, T.C. and Wheaton, J.M., 2014, Is the PDO or AMO the climate driver of soil moisture in the Salmon River Basin, Idaho?, *Global and Planetary Change*, vol. 120, pp. 16-23, DOI: 10.1016/j.gloplacha.2014.05.008.

2013

- Willenbring, J.K., Gasparini, N.M., Crosby, B.T. and Brocard, G., 2013, What Does a Mean Mean? The temporal evolution of detrital cosmogenic denudation rates in a transient landscape, *Geology*, 41: 12, p. 1215–1218, doi:10.1130/G34746.1
- Barnhart, T.B. and Crosby B.T., 2013, Comparing Two Methods of Surface Change Detection on an Evolving Thermokarst Using High-Temporal-Frequency Terrestrial Laser Scanning, Selawik River, Alaska. *Remote Sensing*, 5(6), 2813-2837, doi:10.3390/rs5062813.
- Crosby, B.T. and Martin, P.D., 2013, A Terrestrial Environmental Observation Network (TEON) for the Arctic Landscape Conservation Cooperative; Objectives and Implementation. USFWS/USGS Publication, 50 p., <http://arcticlcc.org/projects/teon>
- Davis, J.M., Baxter, C.V., Rosi-Marchall, E.J., Pierce, J.L. and Crosby, B.T., 2013, Anticipating Stream Ecosystem Responses to Climate Change: Toward Predictions that Incorporate Effects Via Land–Water Linkages, *Ecosystems*, DOI: 10.1007/s10021-013-9653-4
- Davis, J.M., Baxter, C.V., Minshall, G.W., Olson, N.F., Tang, C., Crosby, B.T., 2013, Climate-induced shift in hydrologic regime alters basal resource dynamics in a wilderness river ecosystem, *Freshwater Biology*, v. 58, no. 2, DOI: 10.1111/fwb.12059.
- Whipple, K.X., DiBiase, R.A., Crosby, B.T., 2013. Bedrock Rivers. In: Shroder, J. (Editor in Chief), Wohl, E. (Ed.), *Treatise on Geomorphology*. Academic Press, San Diego, CA, vol. 9, *Fluvial Geomorphology*, pp. 550–573.
- Schuur, E.A.G., B.W. Abbott, W.B. Bowden, V. Brovkin, P. Camill, J.G. Canadell, J.P. Chanton, F.S. Chapin III, T.R. Christensen, P. Ciais, B.T. Crosby, C.I. Czimczik, G. Grosse, J. Harden, D.J. Hayes, G. Hugelius, J.D. Jastrow, J.B. Jones, T. Kleinen, C.D. Koven, G. Krinner, P. Kuhry, D.M. Lawrence, A.D. McGuire, S.M. Natali, J.A. O'Donnell, C.L. Ping, W.J. Riley, A. Rinke, V.E. Romanovsky, C. Schädel, K. Schaefer, J. Sky, Z.M. Subin, C. Tarnocai, M. Turetsky, M. Waldrop, K. M. Walter-Anthony, K.P. Wickland, C.J. Wilson, S.A. Zimov., 2013, Expert Assessment of Vulnerability of Permafrost Carbon to Climate Change, *Climatic Change*, 119:2 DOI 10.1007/s10584-013-0730-7

2012

- Tang, C., Crosby, B.T., Wheaton, J.M., Piechota, T.C., 2012, Assessing streamflow sensitivity to temperature increases in the Salmon River Basin, Idaho, *Global and Planetary Change*, 88-89, p32-44.
- Bowden, W.B., Larouche, J.R., Pearce, A.R., Crosby, B.T., Krieger, K.E., Flinn, M.B., Kampman, J., Gooseff, M.N., Godsey, S., Jones, J.B., Abbott, B., Kling, G.W., Mack, M., Schuur, E.A.G.,

Baron, A., Rastetter, E.B., 2012, An Integrated Assessment of the Influences of Upland Thermal-Erosional Features on Landscape Structure and Function in the Foothills of the Brooks Range, Alaska, in Proceedings of the Tenth international conference on Permafrost; international contributions, *International Conference on Permafrost (ICOP) Proceedings*, 10, Volume 1, p. 61-66.

2011

Schuur, E.A.G., B.W. Abbott, W.B. Bowden, V. Brovkin, P. Camill, J.P. Canadell, F.S. Chapin III, T.R. Christensen, J.P. Chanton, P. Ciais, P.M. Crill, B.T. Crosby, C.I. Czimczik, G. Grosse, D.J. Hayes, G. Hugelius, J.D. Jastrow, T. Kleinen, C.D. Koven, G. Krinner, P. Kuhry, D.M. Lawrence, S.M. Natali, C.L. Ping, A. Rinke, W.J. Riley, V.E. Romanovsky, A.B.K. Sannel, C. Schädel, K. Schaefer, Z.M. Subin, C. Tarnocai, M. Turetsky, K. M. Walter-Anthony, C.J. Wilson, S.A. Zimov., 2011, High risk of permafrost thaw. *Nature* 480, 32-33, doi:10.1038/480032a

2010

Rowland, J.C., C.E. Jones, G. Altmann, R. Bryan, B.T. Crosby, G.L. Geernaert, L. D. Hinzman, D.L. Kane, D.M. Lawrence, A. Mancino, P. Marsh, J.P. McNamara, V.E. Romanovsky, H. Toniolo, B.J. Travis, E. Trochim, C. J. Wilson, 2010: Arctic landscapes in transition - Geomorphic responses to degrading permafrost. *EOS*, 91, 229-230.

2009

Ames, D.P., E. Rafn, R. Van Kirk, and B. Crosby, 2009. Estimation of Stream Channel Geometry in Idaho using GIS-Derived Watershed Characteristics. *Environmental Modeling and Software*, vol. 24, no. 3, p. 444-448

2008

Ouimet, W.B., Whipple, K.X., Crosby, B.T. Johnson, J.P. Schildgen, T.F., 2008, Epigenetic Gorges in Fluvial Landscapes, *Earth Surface Processes and Landforms*, vol. 33, no. 13, p. 1993-2009

2007

Crosby, B. T., Whipple, K. X., Gasparini, N. M. and Wobus, C. W., 2007, Formation of Fluvial Hanging Valleys: Theory and Simulation, *Journal of Geophysical Research-Earth Surface*, vol. 112, F03S10, doi:10.1029/2006JF000566

2006

Crosby, B.T., Whipple, K.X., 2006, Knickpoint initiation and distribution within fluvial networks: 236 waterfalls in the Waipaoa River, North Island, New Zealand, *Geomorphology*, v. 82, no. 1-2.

Wobus, C.W., Crosby, B.T., Whipple, K.X., 2006, Hanging valleys in fluvial systems: Controls on occurrence and implications for landscape evolution, *Journal of Geophysical Research-Earth Surface*, v. 111, no. F2, F02017, 10.1029/2005JF000406.

Wobus, C.W., Whipple, K.X., Kirby, E., Snyder, N.P., Johnson, J., Spyropolou, K., Crosby, B.T., Sheehan, D., 2006, Tectonics from topography: Procedures, promise and pitfalls. in Willett, S.D., Hovius, N., Brandon, M.T., and Fisher, D. M., eds., Tectonics, Climate and Landscape Evolution: Geological Society of America Special Paper 398, Penrose Conference Series, p. 55-74.

Publications: In Review

- Barnhart, T.B., Crosby, B.T., Derryberry, D.R. and Rowland, J.C., in review, Controls on Retrogressive Thaw Slump Retreat Rate and Form, Selawik River, Alaska, at *Permafrost and Periglacial Processes*
- Jensen, A.E., Crosby, B.T., Mora, C.I., Lohse, K.A., in review, Carbon dioxide and methane in soil profiles across a thaw slump chronosequence, northwestern Alaska. at *Journal of Geophysical Research: Biogeosciences*
- Tennant, C.J., Godsey, S.E., Crosby, B.T., Derryberry, D.R., in review, Predicting landscape scale snowpack loss using a climate and elevation-based framework, at *Water Resources Research*

Publications: In Preparation

- Crosby, B.T., Barnhart, T.B., and Rowland, J.C., in prep. Topographic Evolution of a Retrogressive Thaw Slump Derived from SfM, Ground Surveys and Satellite Photogrammetry, for submission to *Earth Surface Processes and Landforms*
- Krieger, K.E., Crosby, B.T., Balsler, A.W. and Bowden, W.B., in prep, Aerial LiDAR Reveals the Distribution and Morphology of Thermal Erosion Features across a Chronosequence of Glacial Deposits, for submission to *Geological Society of America Bulletin*.
- Crosby, B.T., Bierman, P.R., Larouche, J.R., Bowden, W.B., in prep, Meteoric ¹⁰Be Profiles in Frozen Ground: Two examples from Alaska's North Slope, for submission to *Permafrost and Periglacial Processes*
- Crosby, B. T., and Whipple, K. X., in prep, Knickpoint Initiation at Tributary Junctions: a field-based comparison of trunk and tributary response to incision; for submission to *Geomorphology*
- Reynolds, H, Thackray, G.D., Crosby, B.T., Derryberry, D., prep, Influences of spring season precipitation on glacier mass balance in the Teton Range, Wyoming, USA, for submission to *Geomorphology*

Publications: Theses, Reports and Conference Publications

- Crosby, B.T. and Martin, P.D., 2013, A Terrestrial Environmental Observation Network (TEON) for the Arctic Landscape Conservation Cooperative; Objectives and Implementation. USFWS/USGS Publication and steering document, 50 p.
- Whitehead, K.M., Crosby, B.T. and Mahar, J., 2009, Spatial Analysis of Hillslope Failure using High-Resolution Topographic Datasets, Southern California; Proceedings of 42nd Symposium, Engineering Geology and Geotechnical Engineering, p. 5-13
- Tennant, C.J. and Crosby, B.T., 2009, Distinct Regimes: The Hydrology and Geomorphology of Twelve Tributaries to the Salmon River, Idaho; Proceedings of 42nd Symposium, Engineering Geology and Geotechnical Engineering, p. 186-203
- Crosby, B. T., 2006, Transient Response of Bedrock River Networks to Sudden Base Level Fall, Ph.D. Thesis, Massachusetts Institute of Technology, Cambridge, MA, USA. 144 p.

Conference Presentations

2015

- Crosby, B.T., Barnhart, T.B. and Rowland, J.C., 2015, The high resolution topographic evolution of an active retrogressive thaw slump compiled from a decade of photography, ground surveys, laser scans and satellite imagery, Abstract EP54B-05, presented at 2015 Fall Meeting, AGU, San Francisco, Calif., 14-18 Dec.
- Patton, N., Lohse, K.A., Seyfried, M., Crosby, B.T. and Godsey, S.E., 2015, Determining Total Soil Carbon Storage in the Critical Zone Using Topography and Lithology, Abstract H21C-1381, presented at 2015 Fall Meeting, AGU, San Francisco, Calif., 14-18 Dec.
- Tennant, C.J., Harpold, A., Crosby, B.T., Godsey, S.E. and Lohse, K.A., 2015, LiDAR illuminates the influence of elevation, aspect, and vegetation on seasonal snowpack: case studies from four western Critical Zone Observatories, Abstract C33C-0826, presented at 2015 Fall Meeting, AGU, San Francisco, Calif., 14-18 Dec.
- Willenbring, J.K., Brocard, G., Gasparini, N.M., Crosby, B.T., 2015, Persistent landscape transience recorded by in situ-produced ¹⁰Be and numerical modeling, Geological Society of America *Abstracts with Programs*, Vol. 47, No. 7., Session 268.
- Tennant, C.J., Crosby, B.T., Godsey, S.E., VanKirk, R.W., Derryberry, D.R., 2015, A Simple Framework for Quantifying Warming-based Snowpack Declines at the Landscape Scale, Graduate Research Symposium, ISU Office of Research, March, 2015
- Tennant, C.J., Crosby, B.T., Godsey, S.E., VanKirk, R.W., Derryberry, D.R., 2015, A Simple Framework for Quantifying Warming-based Snowpack Declines at the Landscape Scale, USU Spring Runoff Conference, Logan Utah, April 2015.

2014

- Tennant, C.J., Crosby, B.T., Godsey, S.E., VanKirk, R.W., Derryberry, D.R., 2014, A Simple Framework for Quantifying Warming-based Snowpack Declines at the Landscape Scale, Abstract C43A-0366, presented at 2014 Fall Meeting, AGU, San Francisco, Calif., 15-19 Dec.
- Crosby, B.T., 2014, Finding a Home for Technology in a Traditional Geology Field Camp: Lessons from Idaho's Lost River Field Station, Invited presentation at: Field Education and Support by the UNAVCO GAGE Facility, Boulder, CO, 17-18 Nov.
- Crosby, B.T. and Meier, C.I., 2014, The Importance of Fluvial Geomorphology in Hydraulic Engineering, Keynote speaker at El XXI Congreso de Ingeniería Hidráulica, University of Concepción, Chile, 12-14 Jan.

2013

- Willenbring, J.K., Gasparini, N.M., Crosby, B.T., Brocard, and P. Belmont, 2013, Isotopic hysteresis in detrital cosmogenic nuclide-derived denudation rate studies (INVITED), Abstract EP22B-02, presented at 2013 Fall Meeting, AGU, San Francisco, Calif., 9-13 Dec.
- Barnhart, T.B., Crosby, B.T., Derryberry, D.R. and J.C. Rowland, 2013, Using High-temporal-resolution, Repeat Terrestrial LiDAR to Compare Topographic Change Detection Methods and to Elucidate the Hydrometeorologic Controls on the Retreat Rate and Form of the Selawik Retrogressive Thaw Slump, Northwest Alaska, Abstract G33A-0966, presented at 2013 Fall Meeting, AGU, San Francisco, Calif., 9-13 Dec.
- Rowland, J.C., Gangodagamage, C., Crosby, B.T., Pope, P., Brumby, S., Wilson, C.J., 2013, Sensitivity of permafrost dominated river and stream banks to climate change. Abstract H41B-1234, presented at 2013 Fall Meeting, AGU, San Francisco, Calif., 9-13 Dec.
- Gasparini, N.M., Whipple, K.X., Willenbring, J.K., Crosby, B.T., Brocard, G., 2013, What can a numerical landscape evolution model tell us about the evolution of a real landscape? Two examples of modeling a real landscape without recreating it. Abstract EP33A-0870, presented at 2013 Fall Meeting, AGU, San Francisco, Calif., 9-13 Dec.
- Crosby, B.T. and Meier, C.E., 2013, The Importance of Fluvial Geomorphology in Hydraulic Engineering. XXI Congreso Chileno de Ingeniería Hidráulica, Universidad de Concepcion.
- Jensen, A.E., Mora, C., Crosby, B.T., Lohse, K.A., 2013, Carbon dynamics across a retrogressive thaw slump soil chronosequence in northwestern Alaska, Geological Society of America *Abstracts with Programs*, Vol. 45, No. 7., Paper No. 99-2.
- Willenbring, J.K., Gasparini, N.M., Crosby, B.T., Brocard, G., 2013, What Does a Mean Mean? The temporal evolution of detrital cosmogenic denudation rates in a transient landscape, Geological Society of America *Abstracts with Programs*, Vol. 45, No. 7., G34746.1

Willenbring, J.K., Gasparini, N.M., Crosby, B.T., Brocard, G., Occhi, M.E. and P. Belmont, 2013, Temporal evolution of detrital cosmogenic denudation rates in transient landscapes from *in situ*-produced and meteoric ¹⁰Be., Goldschmidt Conference, Florence Italy, #5584.

2012

- Barnhart, T.B., Crosby, B.T., Rowland, J.C. and Finnegan, D., 2012, High-Frequency Terrestrial LiDAR Scanning Reveals Connections between Environmental Drivers and Thaw Slump Headwall Retreat Rate and Form, Selawik River, Alaska, Abstract EP31C-0827 presented at 2012 Fall Meeting, AGU, San Francisco, Calif., 3-7 Dec.
- Gangodagamage, C, Rowland, J.C., Wilson, C.J., Brumby, S., Prancevic, J.P., Crosby, B.T., Marsh, P., Altmann, G., 2012, Topographic Signature of Climate Change- insights into climatic controls on landscape evolution under permafrost and non-permafrost environments, Abstract EP41C-0817 presented at 2012 Fall Meeting, AGU, San Francisco, Calif., 3-7 Dec.
- Jensen, A.E., Crosby, B.T., Mora, C., Lohse, K.A., 2012, Carbon Flux and Isotopic Character of Soils and Soil Gas in Stabilized and Active Thaw Slumps in Northwest Alaska, Abstract B21D-0399, presented at 2012 Fall Meeting, AGU, San Francisco, Calif., 3-7 Dec.
- Tennant, C.J., Crosby, B.T., and Baxter, C.V., 2012, Does Moss Grow on a Rolling Stone? The Influence of Precipitation Phase on Streamflow Characteristics, Bed Particle Transport and Periphyton Development in 18 Mountain Channels, Central Idaho, Abstract EP31B-0816, presented at 2012 Fall Meeting, AGU, San Francisco, Calif., 3-7 Dec.
- Crosby, B.C., Barnhart, T., Calhoun, J.P., Jensen, A., Lanan, K. M., Olson, N.F., Rowland, J.C., 2012, From Thaw Slump to Thalweg: Evaluating the connectivity between hillslope and fluvial processes along the Selawik River, Alaska, extended abstract to the Tenth International Conference on Permafrost, Salekhard, Russia.
- Godsey, S.E., Gooseff, M.N., C.R. Johnson, G.W. Kling, A.E. Giblin, B.T. Crosby, K. Krieger and A.G. Lewkowicz, 2012, Hydrologic and Biogeochemical Responses of Lakes to Fire and Thermokarst Formation in Arctic Alaska, extended abstract to the Tenth International Conference on Permafrost, Salekhard, Russia
- Grosse, G., Sannel, A.B.K., Schuur, E.A.G., Research Coordination Network Vulnerability of Permafrost Carbon: Thermokarst Working Group, 2012, A Database Synthesizing Published Data on Thermokarst and Thermo-Erosion Processes, extended abstract to the Tenth International Conference on Permafrost, Salekhard, Russia
- Burkart, G, Crosby, B.T., Liljedhal, A., Martin, P, et al., 2012, Building a Network of Watershed Observations Sites in Support of Conservation, American Water Resource Association meeting, Juneau, AK

2011

- Barnhart, T.B., and Crosby, B.T., 2011, Using High Frequency Terrestrial LiDAR to Correlate Meteorological and Hydrological Drivers to the Expansion of a Retrogressive Thaw Slump along the Selawik River, Alaska, Abstract C52A-05 presented at 2011 Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.
- Calhoun, J.P. and Crosby, B.T., 2011, Permafrost Degradation and Stream Metabolism in the Arctic: The effect of thaw slump sedimentation on biological productivity and water quality in the Selawik River, Northwest Alaska, Abstract EP23B-0745 presented at 2011 Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.
- Crosby, B.T. and Rowland, J.C., 2011, Geomorphic Buffering of Climate Signals: A study of how landscapes delay and diminish environmental forcings, Abstract EP51C-01 presented at 2011 Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec. (INVITED)
- Crosby, B.T., Willenbring, J.S. and Gasparini, N.M., 2011, What Does a Mean Really Mean? Interpreting Mainstem Detrital CRN Data in Transient Landscapes, a view from the South Fork Eel River, CA, Abstract EP44B-07 presented at 2011 Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.
- Lanan, K.M. and Crosby, B.T., 2011, Can Mapping Glacial Deposits Help Predict the Location of Future Thermal Erosion Features in Arctic Alaska? A study from the Selawik River Basin, Northwest Alaska, Abstract C41C-0421 presented at 2011 Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.
- Rowland, J.C., Gangodagamage, C., Wilson, C.J., Prancevic, J.P., Brumby, S.P., Marsh, P., Crosby, B.T., 2011, Scaling Laws in Arctic Permafrost River Basins: Statistical Signature in Transition, Abstract C41C-0424 presented at 2011 Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.
- Tennant, C.J., Crosby, B.T., 2011, The Influence of Precipitation Phase on Hydrograph Form, Abstract H43I-1346 presented at 2011 Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.

- Baxter, C.V., Davis, J.M., Crosby, B.T., Pierce, J. L., Rosi-Marshall, E., 2011, Indirect Effects of Climate Change on Stream-Riparian Ecosystems: a View on Forest, Fire, and Flow Dynamics from Idaho's Salmon River Basin, American Fisheries Society, Seattle, WA.
- Crosby, B.T., Arctic LCC hydrology working group, 2011, Building a Hydrology Science Plan for the Arctic Landscape Conservation Cooperative, Fourth Interagency Conference on Research in the Watersheds, Fairbanks, AK.
- Crosby, B. T. and Rowland, J.C., 2011, Terrestrial Disturbances – Aquatic Implications: The effects of fire and thermal erosion in the Selawik River Watershed, Northwest Alaska CESU Meeting, Anchorage, AK
- Davis, J. M, Minshall, G. W, Baxter, C. V, Olson, N. F, Tang, C., Crosby, B. T, 2011, Predicting Effects of Earlier Runoff on Periphyton: Implications of Climate Change From a 20-Year Study of Wilderness Streams in Idaho, North American Benthological Society Annual Meeting, Providence, RI.

2010

- Rowland, J.C., Crosby, B.T., Travis, B.J., 2010, The potential influence of thaw slumps and sea-level rise on the Arctic carbon cycle, Abstract NH13B-1150, presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec. (INVITED)
- Crosby, B. T., 2010, Constructing a Temporal and Spatial Record of Lightning Strikes in Arctic Alaska: Discerning between increased strike frequency and increased detection capability, Abstract C31A-0508, presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.
- Krieger, K.E., Crosby, B.T., 2010, The Topographic Evolution of Thermal Erosion Features: an investigation using an airborne LiDAR transect across a chronosequence of glacial deposits, Abstract C41C-07, presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.
- Phillips, C.B., Jerolmack, D.J., Crosby, B. T., 2010, Seepage erosion of Arctic coastal bluffs driven by thawing permafrost in Northwest Alaska, Abstract EP53D-0646, presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.
- Godsey, S., Gooseff, M.N., Johnson, C., Lewkowicz, A.G., Krieger, K.E., Crosby, B.T., 2010, Hydrological and Biogeochemical Responses to Fire and Thermokarst Formation in Arctic Alaska Abstract GC43A-0947, presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.
- Tennant, C.J., Crosby, B.T., 2010, Designing Hydroecologic-Geomorphic Monitoring Networks to Capture Heterogeneity and Predict the Influence of Climate Change on Hydrologic, Ecologic and Geomorphic Processes, Abstract H43D-1293, presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.
- Tang, C., Crosby, B. T., Chen, D., 2010, The impacts of climate changes on streamflow in the Salmon River Basin, Abstract H51A-0875, presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.
- Tennant, C.J., Crosby, B.T., 2010, The Influence of Precipitation Phase on Hydrograph Form, Geological Society of America *Abstracts with Programs*, Vol. 42, No. 5, p. 315
- Krieger, K.E., Crosby, B.T., 2010, High Resolution Geomorphic Characterization and Evolution of Thermal Erosion Features, Arctic Alaska, Geological Society of America *Abstracts with Programs*, Vol. 42, No. 5, p. 176
- Cornell, J. J. , J. M. Davis, G. W. Minshall, C. V. Baxter, A. T. Rugenski, N. F. Olson, and B. T. Crosby, 2010, Effects Of Earlier Spring Snow Melt On Periphyton Biomass: Potential Climate Change Implications From A 20-Year Study Of A Wilderness Stream Ecosystem, NABS Meeting, Santa Fe, NM.
- Davis, J., Baxter, C., Crosby, B., Rosi-Marshall, E., Pierce, J., 2010, Do Indirect Effects Of Global Climate Change On Forest, Fire, And Flow Dynamics Mediate Responses Of Stream-Riparian Ecosystems?, NABS Meeting, Santa Fe, NM.
- Tang, C., Crosby, B. T., Wheaton, J.M., 2010, How Climate Changes impact on Streamflow in the Salmon River Basin, USU Spring Runoff Conference Proceedings, p. 5, Logan, Utah
- Tennant, C.J., Crosby, B.T., 2010, The Influence of Topography on Runoff for Selected Tributaries to the Salmon River, Idaho, USU Spring Runoff Conference Proceedings, p. 17, Logan, Utah

2009

- Crosby, B. T., 2009, Progressive Growth, Modulated Supply: How coupling and decoupling between an enormous retrogressive thaw slump and its depositional fan impacts sediment delivery to the Selawik River, Northwest Alaska, *Eos Trans. AGU*, 90(52), Fall Meet. Suppl., Abstract U41C-0043.

- Krieger, K., Crosby, B. T., Phillips, C., Godsey, S., Jerolmack, D. J., 2009, Slump Scaling: Common Geometries Observed from Retrogressive Thaw Slumps in Three Different Environments in Arctic Alaska, , *Eos Trans. AGU*, 90(52), Fall Meet. Suppl., Abstract U41C-0044.
- Pierce, J. L. Baxter, C. V., Yager, E. M., Fremier, A. K., Crosby, B. T., Smith, A. M., Kennedy, B., Hicke, J. A., Feris, K., 2009, Forests, fire, floods and fish: nonlinear biophysical responses to changing climate, *Eos Trans. AGU*, 90(52), Fall Meet. Suppl., Abstract U13B-0074.
- Tang, C., Crosby, B. T., Wheaton, J. M., 2009, From Snow to Rain: Assessing streamflow sensitivity to changes in climate using a hydrologic model for the Salmon River Basin, Idaho, *Eos Trans. AGU*, 90(52), Fall Meet. Suppl., Abstract H33E-0928.
- Tennant, C. J., Crosby, B. T., 2009, Distinct Regimes: Using Hypsometry and Field Observations to Predict the Hydrologic and Geomorphic Response to Changes in Precipitation Phases within the Salmon River, Idaho, *Eos Trans. AGU*, 90(52), Fall Meet. Suppl., Abstract U43A-0064.
- Crosby, B. T., 2009, The Interplay Between Storage and Delivery: An Examination of Temporally Varying Sediment Flux to the Selawik River from an Enormous Retrogressive Thaw Slump, NW Alaska; Geological Society of America *Abstracts with Programs*, Vol. 41, No. 7, p. 574.
- Olson, N. F., Crosby, B. T., 2009, Influences of Topography on Spring Runoff, Geological Society of America *Abstracts with Programs*, Vol. 41, No. 7, p. 290.
- Tennant, C. J., Crosby, B. T., 2009, Distinct Regimes: The Hydrology and Geomorphology of Twelve Tributaries to the Salmon River, Geological Society of America *Abstracts with Programs*, Vol. 41, No. 7, p. 289.
- Whitehead, K. M., Crosby, B. T., Mahar, J., 2009, Using High-Resolution DEMs to Identify Spatial Correlations Between Topographic Form and Hillslope Failure Mechanisms, Southern California, Geological Society of America *Abstracts with Programs*, Vol. 41, No. 7, p. 677.
- Olson, N. F., Crosby, B. T., 2009, Topographic Controls on the Magnitude and Timing of Peak Spring Runoff in a Snow-Dominated Basin in Central Idaho, USU Spring Runoff Conference Proceedings, p. 27, Logan, Utah
- Tennant, C.J., Crosby, B.T., 2009, Climate Change and Potential Alterations in the Timing and Magnitude of Snow-Melt Runoff Events within the Salmon River Basin, USU Spring Runoff Conference Proceedings, p. 26, Logan, Utah

2008

- Carlson, E. J., Crosby, B. T. and Olson, N. F., 2008, Temporal and Spatial Variation in Tributary and Mainstem Suspended Sediment Fluxes in Big Creek, a Recently Burned Sub-Alpine Idaho Catchment, *Eos Trans. AGU*, 89 (53), Fall Meet. Suppl., Abstract H53C-1089 .
- Crosby, B. T., and C. V. Baxter, 2008, Scaling the Geomorphic and Ecological Consequences of Contemporary Climate Change Within the Salmon River Watershed, Central Idaho: A View From Taylor Ranch Field Station, *Eos Trans. AGU*, 89 (53), Fall Meet. Suppl., Abstract H13C-0947.
- Olson, N. F. and B. T. Crosby, 2008, Topographic Controls on the Distribution and Timing of Spring Runoff in a Snow- Dominated Basin in Central Idaho, *Eos Trans. AGU*, 89 (53), Fall Meet. Suppl., Abstract H31E-0920.
- Whitehead, K., B. T. Crosby, and J. Mahar, 2008, Variation in Geologic and Topographic Setting Cause Spatial Correlations Between Hillslope Failure Mechanisms in the Ridge Basin, California, *Eos Trans. AGU*, 89 (53), Fall Meet. Suppl., Abstract H51F-0905.

2007

- Crosby, B. T., and N. F. Olson (2007), Quantifying River Morphology in Arctic Streams: Remote Sensing and Field Based Measurement of Fluvial Response to Climate Change in Northern Alaska, *Eos Trans. AGU*, 88(52), Fall Meet. Suppl., Abstract H41D-0769.
- Olson, N. F., and B. T. Crosby (2007), Digital Mapping of Coastal Erosion on the Baldwin Peninsula, NW Alaska: Past Rates, Present Processes and Future Implications, *Eos Trans. AGU*, 88(52), Fall Meet. Suppl., Abstract GC33A-0962.
- Crosby, B. T., and N. F. Olson (2007), Landscape-Scale Geomorphic Responses to Permafrost Degradation in NW Alaska: Impacts on sediment dynamics, fish habitat and the sustainability of river villages., 15th Annual Conference on the Arctic, Pocatello, ID.
- Crosby, B. T., and J. S. Willenbring (2007), Evaluating the Crustal Conveyor: an analysis of terraces and channel profiles along the South Fork Eel River, Northern California, Geological Society of America *Abstracts with Programs*, Vol. 39, No. 6, p. 262.
- Knoop, P., D. Mogk, B. T. Crosby, M. Helper, M. Manone, N. Niemi, J. Snyder, B. Van Der Pluijm, T.

Wawrzyniec, and D. Walker (2007), Using Digital Information Technologies in Geoscience Field Courses, Geological Society of America *Abstracts with Programs*, Vol. 39, No. 6, p. 622.

2006 and earlier

- Crosby, B. T., and Whipple, K. X., 2006, Application of Digital Field Tools for Geomorphic Analysis to Incisional River Networks: EOS AGU, v. 87, no. 52, p. Fall Meet. Suppl., Abstract H13E-1446, San Francisco, CA.
- Crosby, B. T., and Whipple, K. X., 2006, Knickpoints and Terraces: Delays in the upstream transmission of fluvial incision signals, *in* NSF MARGINS Theoretical Institute 2006: Teleconnections Between Source & Sink in Sediment Dispersal Systems, Eureka, CA.
- Crosby, B. T., Whipple, K.X., Gasparini, N.M., Wobus, C.W., 2005, Knickpoint Generation and Persistence Following Base-Level Fall: An Examination of Erosional Thresholds in Sediment Flux Dependent Erosion Models, AGU, Fall Meeting, San Francisco, CA (*INVITED*)
- Crosby, B. T., Whipple, K.X., 2005, Bedrock River Incision Following Aggradation: Observations from the Waipaoa River Regarding Tributary Response to Mainstem Incision and the Role of Paleotopography, AGU, Fall, San Francisco, CA
- Whipple, K.X, Heimsath, A., Ouimet, W.B., Crosby, B.T., Wobus, C.W., 2005, The Relation Between Topography and Millennial Erosion Rates in the San Gabriel Mountains, California, AGU, Fall, San Francisco, CA
- Crosby, B. T., Whipple, K.X., 2004, Knickpoints in Fluvial Systems: Comparing Models of Basin-Wide Propagation and Initiation at Erosional Thresholds, AGU, Fall Meeting, San Francisco, CA
- Wobus, C.W., Crosby, B.T., Whipple, K.X., 2004, Hanging Valleys in Fluvial Systems: A Failure of Stream Power and Implications for Landscape Evolution, AGU, Fall Meeting, San Francisco, CA
- Crosby, B.T., Whipple, K.X., 2004, Knickpoint Initiation and Distribution within Fluvial Networks: two models for distributing a pulse of incision in a fluvial network, GSA Meeting,, Denver, CO
- Crosby, B. T., Whipple, K., 2002, Knickpoint Migration in the Waipaoa River: An Examination of the Rate and Form of Transient Behavior in Fluvial Networks, AGU, Fall Meeting, San Francisco, CA
- Crosby, B. T., Dietrich, W.E., 1999, Terraces on the South Fork of the Eel River, California: Geological Society of America, Cordilleran Section, 95th annual meeting abstracts, 31(6), p.48

University Service

- Idaho State University / Pocatello, ID (2006-)
 - Department Level:*
 - Member of Departmental Tenure and Promotion Review Committees:
 - Ames, Tapanila, Glenn, Lohse, Godsey, Link, Tapanila, Thackray
 - Member of 5 Departmental Search Committees, Chair for 1:
 - Cyberinfrastructure TT-AP, Spatial Hydrologist TT-AP, Volcanologist TT-AP, GIS Instructor/Lecturer, Surface Processes VAP
 - Facilities Director for Lost River Field Station
 - Design, Development and Management of ISU WaterLab Flume Facility
 - Member of review committee for departmental ‘Geslin Fund’ research award
 - Faculty Representative for the Digital Mapping Laboratory, directed renovation
 - Alternate for Chair’s meetings and University Curriculum Council meetings
 - Committee to redesign the Earth and Environmental Sciences major/curriculum
 - Committee to design catalog copy for the new Geosciences PhD Program
 - Co-Advisor for Earth and Environmental Sciences BA/BS program (~30 students advised)
 - Departmental Colloquium Director (2010-2012)
 - ISU Geoscience representative to the Center for Ecosystem Research and Education (CERE)
 - Geotechnologies Faculty Member
 - Departmental Representative for “Evening of Opportunity,” Ug. Recruitment (3x)
 - Departmental Representative for “Major’s Fair,” Ug. Recruitment (5x)
 - University Level:*
 - Invited Presentation: Sabbatical Reflections: Inspiring Faculty to Become Fulbright Scholars
 - General Education Requirements Committee (Member 2006-9, Secretary 2011-13)
 - College of Science and Engineering Promotion and Tenure Committee (2013)
 - Sabbatical Review Committee (2006-2010)
 - Invited panelist for Student Affairs Committee under the Academic Affairs Office
 - Established for ISU’s partnership with the N. and W. AK Coop. Ecosystem Studies Unit (2009)
 - Established for ISU’s research partnership with UNAVCO (2008)
 - Helped established for ISU’s research partnership with CUAHSI (2010)
- MIT / Boston, MA
 - 1 of 15 MIT students selected to advise the new MIT President on student affairs (2004-2005)
 - Vice-President of “EGSAC,” MIT departmental student organization, (2002-2005)
 - Member of departmental mentoring program: advising incoming grad students. (2003-2005)
 - Course Mentor, ‘Earthscope’ freshman research initiative: “ANWR and/or Oil?” (Fall 2003)
- UC Berkeley, Berkeley, CA
 - Student Rep. of the Curriculum Committee, Geology Department (1997-1999)
 - Founder and President of “Berkeley Rocks”: student advocacy group for Earth Science undergraduates. (1996-1999)

Professional Service and Affiliations

- AGU-Earth and Planetary Surface Processes Focus Group Program Committee (2015-2016)
- ISU Representative to CHAHSI (Consortium of Univ. for the Adv. of Hydrologic Science, Inc.)
- ISU Representative to UNAVCO, a consortium for geoscience research and education
- Member, CHAHSI–HIS User Committee. (2012-2013)
- Field Trip Leader: Friends of the Pleistocene: “The Bonneville Flood—Revisited!”
- Affiliate Faculty with the Idaho Museum of Natural History
 - Docent training talks (3x), Exhibit development, Outreach Participant
- Chair for Sessions at Professional Meetings
 - “Incorporating Geodesy into Undergraduate Curriculum” GSA 2016
 - “Thermal Control on Weathering, Erosion and Landscape Evolution,” AGU 2012
 - “Community Earth-surface science: Articulating a vision for the future” AGU Townhall, 2011
 - “Hydrogeomorphic processes in hillslopes, rivers, and landscapes,” GSA, 2010
 - “Response of the Arctic Landscape to a Warming Climate,” AGU, 2009
 - “Surface Processes” Chaired Session for 14th ICE & 42nd EGGES, Pocatello, 2010
 - “Watersheds,” Intermountain Conference for the Environment, 2009
 - “Deformation and the landscape: Quantitative approaches to tectonic geomorphology,” GSA, 2007

- Peer Review of Publications
 - Nature, Geology, Earth Surface Dynamics, J. of Geophysical Research, Geophysical Research Letters, J. of Geology, Earth and Planetary Science Letters, USGS Publications, EOS, Geomorphology, Earth Surface Processes and Landforms, Marine Geology, PLoS ONE, Permafrost and Periglacial Processes, New Zealand Journal of Marine and Freshwater Research
- Peer Review of Proposals
 - NSF Panel work (Arctic Observing Network, Coupled Human and Natural System)
 - Fulbright Scholar Program: US review panel for Chile applicants, 2016-17
 - NSF (Many proposals in different divisions, CAREER, Geo, EPSCoR),
 - NASA
 - DOE
 - American Chemical Society's PRF
 - United States-Israel Binational Science Foundation
- Invited Lecturer
 - Geologists of Jackson Hole, 2016
 - Colorado State University, 2016
 - Boise State University, 2012, 2015
 - Los Alamos National Laboratory, 2011
 - University of Oregon, 2011
 - APECS Early Career Series, 2011 ([Vimeo Link](#))
 - Utah State University, 2010, 2007
 - University of Montana, 2008
 - University of Idaho, 2007
- Judge for student presentations at professional meetings
 - AGU 2011, 2012, 2014, 2015, 2016
 - 3rd and 4th Annual Tri-State Meeting Poster Competitions, NSF EPSCoR
- Senior Personnel / Advisory Group, Cent. For Ecohydraulics, U of I, Mountain Stream Lab
- Professional Affiliations
 - American Geophysical Union, Geologic Society of America, Sigma Xi

Public Service

- Pocatello, ID (2006-)
 - Bannock County Bike to Work Committee, 2016
 - Invited lecture at ISU's New Knowledge Adventurers: 09/2015, 10/2015
 - Invited lecture, Rotary Club, 4/2015
 - Invited lecture, for Yellowstone Sci. Expedition, Pocatello Comm. Charter Sch., 2012, 2013, 2016
 - Field Trip Leader/Lecture: Starlight Formation Clay Quarry. Franklin Middle School, 9/2014
 - Portneuf Watershed Partnership, 2008-2016
 - Science Advisor to the civic group Valley Pride regarding the Portneuf River Restoration Project
 - Group leader, Portneuf River Clean-Up (5 years)
 - Guest lecture History of Yellowstone, Pocatello Comm. Charter School
 - Guest Lecturer, Pocatello Zoo; "The Great Climate Debate"
 - Presenter within Docents Program at the ISU Museum of Natural History (3 years)
 - Design and construction of Parade Float for Jefferson Elementary (2 years)
 - Participant and educator for natural science field trips: Jefferson Elementary
 - Occasional builder with Habitat for Humanity
- Boston, MA (2000-2006)
 - Guest Lecturer / Thesis Advisor Milton Academy (high school) (2002-2004)
 - Website design for St. Christopher's Preschool
- Berkeley, CA (1995-1999)
 - Public Relations for Cooperative Student Housing, City of Berkeley, CA

Synergistic activities

- Author of website and computational tools for topographic analysis* (2003-present)
Tools were developed to allow users to extract topographic data from digital elevation maps using the combined computational efficiency of ArcGIS and MATLAB. These tools are currently in use at numerous institutions by research groups in Geology, Biology and Engineering departments. The tools are now freely available (<http://geomorphtools.org>) and an [oversubscribed short course](#) (#506) was taught at the 2007 GSA Meeting in Denver. Discussion forum added to website in Jan, 2009. Open to public Feb, 2009.
- Innovation and publication of a new curriculum for digital field geology.* (2005-present)
Developing classroom and field exercises to train undergraduate and graduate students from numerous institutions on the best methods of doing data collection and analysis using modern mobile GIS tools. This curriculum has been utilized at numerous other schools and presented at conferences and shortcourses. It is currently in use at MIT's and ISU's field geology camp. Courses have also been taught at the Univ. of Idaho. Materials created are available at: (<http://web.mit.edu/12.114/>) and (http://serc.carleton.edu/research_education/geopad/).
- Seminars and Shortcourses Regarding Arctic Research, Kotzebue, AK* (2006, 07,09,10,11)
Following each field season, I meet with agency managers and staff at the NPS, US FWS and Native Corporations to present the findings of my summer research. I also receive direction from these groups regarding which concerns are of greatest importance to their missions. I also provide public lectures open to the general community to share our research findings.
- Management of Digital Mapping Laboratory, ISU-Geosciences* (2006-present)
I oversee the operation of [this facility](#) and the maintenance of the hardware and software therein. Though my students are the most intensive users of the facility, I am responsible for assuring that all researchers in the department have the optimum equipment to complete the geospatial or computational components of their work.
- Senior Personnel / Advisory Group, Cent. For Ecohydraulics, U of I Mountain StreamLab* (2010-2011)
I help advise the Mountain StreamLab on the development and implementation of a suite of technology used in their flume facility. This technology utilizes still and video imagery as well as database distribution tools to increase user accessibility to a unique, large, steep, sediment circulating flume.
- Advisor within departmental mentoring program (graduate and undergraduate students).* (2003-2006)
- Geologic curriculum development for Native Alaskan students, N.P.S., Kotzebue, Alaska* (1999-2000)
- Advisor within MIT mentoring program (graduate and undergraduate students).* (2003-2006)

Teaching Experience

As Assistant and Associate Professor: Idaho State University

- Geol 1100, The Dynamic Earth: Earth System Science: Undergraduate (06,8,9,12,14,16)
 New curriculum, Lectures and assisting with creation of new labs (~120 students)
- Geol 3315, Evolution of the Earth's Surface, Undergraduate (09,10,13, 16)
 Lecture, Lab, Field. New offering with all new curriculum and exercises (~20)
- Geol 4402/5502, Geomorphology: Mixed Grad/undergrad class (F06-08,12,15)
 Lecture, lab and field course with emphasis on GIS and quantitative tools (~15)
- Geol 4491, Advanced Field Seminar; Mixed Grad/undergrad class (~25) (many)
 Planning and execution of 9 day field excursions
 Death Valley, Owens Valley, CA (2007)
 Western Wyoming's high erosional surfaces. (2010)
 Utah's Henry Mountains (2012)
 Volcanism, Landslides, River Evol. Of Southeast Oregon (2016)
- Geol 4450, Field Geology; Grad/undergrad class (~25) (Su 07-08, 11-12)
 Instructed students on field techniques for geologic/digital mapping and struct/geomorph interp.
- Geol 4451/5551, Field Methods in Environmental Sciences; Grad/UG class (~15) (Su 15, 16)
 New curriculum. Design and implementation of interdisciplinary 2 week capstone.
- Geol 5599, Surface Processes Seminar; Graduate Students (Fall 2008)
 Reading and synthesis seminar for incoming and senior graduate students (~10)
- Geol 5599, Quantitative Tools for Earth Scientists; Graduate Students (S09, 11)
 Development of modeling and analytical skills in MATLAB (~15)
- Geol 5599, River Mechanics and Field Techniques; Graduate Students (Fall 2009)
 In-depth study for stream ecology/geomorphology/civil engineering students (~10)
- Geol 5599, Arctic Surface Processes/Water seminar; Graduate Students (Fall 2010, 11)
 A coordinated interdisciplinary study with students/faculty at multiple universities (~30)
- Geol 6601, Advance Physical Geology; All graduate students (F07, 08, 10, 14)
 Required for all incoming students, research and discussion skills, with Dr. Rodgers (~7)
- Geol 6602, Advanced Geomorphology. New course every time! (~15)
 Climate, Tectonics and Erosion; Graduate Level (Spring 2007)
 Geomorphology of Managed Rivers: dams, fires, forestry, restoration (Spring 2008)
 Mass and Energy Conservation Principles and Surface Processes (Spring 2012)
 Hillslope Processes in the Built and Natural Environment; Graduate (~15) (Spring 2015)

Visiting Fulbright Scholar, Universidad de Concepción, Chile

- Hillslope Processes in the Built and Natural Environment ('*Riesgos en Laderas*') (Fall, 2013)
 Ug., Grad course on Hillslope transport process and implications for engineers
- Graduate Research seminar (Fall, 2013)
 Supervision and advising of students on research, presentations, publications

Teaching Assistant: M.I.T.

- Field Geology I and II: Traditional & Digital Tools: (2005-2006)
 Lectures, labs, field trips, 4-week field course, GIS tool development, web design.
- Surface Processes & Landscape Evolution: (Fall 02, 04)
 Lectures, labs, field trips, GIS tools development, web design.
- Senior Thesis Course: (Spring 2004)
 Advised students on research projects and supervised thesis writing.
 Authored the departmental 'Undergraduate Handbook for Thesis Preparation.'

Teaching Assistant: U.C. Berkeley

- Fluvial Geomorphology in River Restoration (Fall, 2004)
 Lectures, documentation preparation, field and lab exercises.

Teaching Assistant: Harvard University, Extension School

- Earth Surface Processes (Spring, 2003)
 Occasional Lecture, Laboratories, Advised students during research projects

Technical Skills

GIS Software: the ArcGIS family: [ArcMap, ArcToolbox, ArcScene, ArcCatalog], ArcINFO

Field Hydrology Tools: Acoustic Doppler Velocimeters/Profilers, YSI Multi-Parameter Sondes, Level loggers

Hydrologic Models: VIC (Variable Infiltration Capacity Model)

Sediment Sampling/Tracking Tools: ISCO pumps, Isokinetic Samplers (hand and bridge-based), RFID Tracers

Geochronology Sampling: OSL, Detrital, meteoric and in-situ cosmogenic nuclide, ¹⁴C

Geochemical Sampling: Li-Cor CO₂ chambers, Dogbone isotope samplers, river and soil water sampling

GPS and Surveying tools:

Reigl, Leica and Optech ground-based LiDAR,

Leica Robotic Total Stations, Leica System 1200 RTK Survey-Grade GPS,

Trimble Geo- and Pro-series GPS;

Integrated hand-held computer/laser rangefinder/GPS, DGPS, Rod-Level, etc.

Environmental Sensors: Campbell Scientific, Sutron, Onset-HOBO loggers, iButtons, Time-Lapse Cameras

Remote Sensing Software: RSI's ENVI, ERDAS Imagine, PCI Geomatica, Leica suite

Computational Software: Matlab (preferred language), Excel

Graphic Design: Illustrator, Photoshop, Premier Pro (digital video), Dreamweaver (web design), etc.

Short courses and Workshops

- Geodesy tools for undergraduate curriculum; GSA 2016
- Invited presentation and participant: "Field Education and Support by the UNAVCO GAGE Facility," November 17-18, 2014, Boulder, Colorado
- Invited presentation and participant: "The Field Tradition in Geomorphology," 43rd Annual Binghamton Geomorphology Symposium, September, 2012, Jackson Hole, WY
- Invited speaker and participant: "The Sedimentary Record of Landscape Dynamics," Meeting of Young Researchers in the Earth Sciences V, (MYRES), August, 2012, Salt Lake City, UT
- Invited participant: "Community Workshop: Charting the Future of Terrestrial Laser Scanning (TLS) in the Earth Sciences and Related Fields", UNAVCO Facility, October, 2011; Boulder, CO
- Invited participant: "New Tools in Process-Based Analysis of Lidar Topographic Data Workshop," June, 2010; Boulder, CO
- NSF – Margins, "Source to Sink" Workshop; Invited Co-chair of Modeling session, New Zealand, 2009
- Invited Participant, "Teaching Geomorphology in the 21st century" July, 2008; Fort Collins, CO
- Invited Participant, MYRES 2008, "Life and Landscape," New Orleans, LA
- Co-Author Short-Course: "Computational tools for Geomorphology/GIS/Stream Profile Extraction"
 - Released through workshops at GSA professional meeting in 2007
- Authored Shortcourse on Digital Tools for Field Science, July, 2007 Taylor Ranch
- Invited participant, GeoPads Conference, 2007
- Cutting Edge Workshop for Early Career Faculty, 2007
- GIS Day Presentation, "GIS Tools for Digital Field Geology", 2006
- Fluvial Geomorphology: Principles and Practice, Univ.of California
- Invited presentation: NSF-MARGINS Workshop on the Waipaoa Focus Area (Source-to-Sink Initiative), Wellington, New Zealand: May, 2003.
- France/New Zealand Cooperative Project: A Workshop on Sediment Management in River Systems: Gisborne, New Zealand, February, 2003

Previous Advisors

PhD Graduate Thesis Advisor

Dr. Kelin Whipple, Professor of Geology, Thesis advisor, MIT, now at ASU

PhD Graduate Committee

Dr. Rafael Bras, Professor of Civil and Environmental Engineering, MIT, now GIT

Dr. David Mohrig, Associate Professor of Geology, MIT, now University of Texas at Austin

Dr. Leigh Royden, Professor of Geophysics, MIT

Dr. Thomas Dunne, Professor, Brenn School, UC Santa Barbara

B.A. Undergraduate Thesis Advisor

Dr. Bill Dietrich, Professor of Earth and Planetary Sciences, UC Berkeley