

Sara L. Rathburn

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Colorado State University
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EDUCATION

Ph.D., Colorado State University, Earth Resources; 2001, Dissertation: *Modeling Pool Sediment Dynamics in a Mountain River*

M.S., University of Arizona; Geosciences; 1989, Thesis: *Pleistocene Glacial Outburst Flooding along the Big Lost River, East-Central Idaho*

B.S., Colorado State University; Earth Resources, High Distinction; 1985

PROFESSIONAL EXPERIENCE

Associate Professor, Colorado State University, Fort Collins, CO, Department of Geosciences, 2007-present

Assistant Professor, Special Appointment, Colorado State University, Fort Collins, CO, Department of Geosciences, 2001-2007

Doctoral Student/Research Assistant, Colorado State University, Fort Collins, CO, Department of Earth Resources, 1996-2000.

Adjunct Instructor, Miami University, Oxford, OH, Department of Geology, 1993-1996

HONORS AND AWARDS

- Geological Society of America Fellowship 2019
- Warner College Outstanding Publication Award 2018
- Warner College Outstanding Mentorship Award 2017
- Gladys W. Cole Memorial Research Award, Geological Society of America 2016
- Warner Distinguished Teacher/Advisor Award 2008
- Master Teacher Coordinator, Warner College of Natural Resources 2008-2011
- Best Teacher Award nomination, Alumni Association, Colorado State University 2007
- Excellence in Education Award, Colorado State University, Fall and Spring 2005

PROFESSIONAL AFFILIATIONS

- Geological Society of America
- American Geophysical Union
- Association of Women Geoscientists
- Phi Beta Kappa

PUBLICATIONS (* indicates student author)

Refereed Journal Articles:

Rathburn, S., Patton*, A., and Bilderback, E., 2019, Historical debris-flow occurrence in Rocky Mountain National Park, CO, 7th International Debris-Flow Hazards Mitigation.

- Comiti, C., Mao, L., Penna, D., Dell’Agnese, A., Engel, M., **Rathburn, S.**, and Cavalli, M., 2019, Glacier melt runoff controls bedload transport in Alpine catchments, *Earth and Planetary Science Letters*.
- Wohl, E., Lininger*, K., **Rathburn, S.**, and Sutfin, N., 2019, How geomorphic context governs the influences of wildfire on floodplain organic carbon storage in fire-prone environments of the Western United States, *Earth Surface Processes and Landforms*.
- Patton*, A., **Rathburn, S.**, and Capps, D., 2019, Landslide response to climate change in permafrost regions, Invited Review, *Geomorphology*, doi:10.1016/j.geomorph.2019.04.029
- Sparacino*, M., **Rathburn, S.**, Singha, K., Covino, T., and Ronayne, M., 2019, Form-based channel restoration decreases hyporheic exchange: Lessons learned from monitoring the Upper Colorado River, *Earth Surface Processes and Landforms*, doi:10.1002/esp.4525.
- Patton*, A., **Rathburn, S.**, Bilderback, E., and Lukens*, C., 2018, Patterns of debris flow initiation and periglacial sediment sourcing in the Colorado Front Range, *Earth Surface Processes and Landforms*, 43:2998-3008, doi:10.1002/esp.4463. (Editor’s Choice in 2018)
- Rathburn, S.L.** and Putman, J.M, 2018, Connecting students and mentors through local research hubs, *Eos*, 99, doi.org/10/1029/2018EO101511.
- Wohl, E., Brierley, G., Cadol, D., Coulthard, T., Covino, T., Fryirs, K., Grant, G., Hilton, R., Lane, S., Magilligan, F., Meitzen, K., Passalacqua, P., Poepl, R., **Rathburn, S.**, and Sklar, L., 2018, Connectivity as an emergent property of geomorphic systems, *Earth Surface Processes and Landforms*, State of the Science, doi:10.1002/esp.4434.
- Anthony*, R., Aster, R., Ryan, S., **Rathburn, S.**, and Baker*, M., 2018, Monitoring discharge on a small mountain river using seismographs emplaced within the hyporheic zone, *Journal of Geophysical Research-Earth Surface*, doi:10.1002/2017/JF004295.
- Rathburn, S.**, Shahverdian*, S., and Ryan, S., 2018, Post-disturbance sediment recovery: Implications for watershed resilience, *Geomorphology*, doi.org/10.1016/j.geomorph.2017.08.039.
- Schook*, D., **Rathburn, S.**, Friedman, J., and Wolf*, M., 2017, A 184-year record of river meander migration from tree rings, aerial imagery, and cross sections, *Geomorphology*, 293:227-239, doi.org/10.1016/j.geomorph.2017.06.001.
- Rathburn, S.**, Bennett, G., Wohl, E., Briles, C., McElroy, B., and Sutfin*, N., 2017, The fate of sediment, wood, and organic carbon eroded during an extreme flood, Colorado Front Range, USA, *Geology*, doi:10.1130/G38935.1.
- Schook*, D., Friedman, J., and **Rathburn, S.**, 2016, Flow reconstructions in the Upper Missouri River Basin using riparian tree rings, *Water Resources Research* 52(10):8159-8173, doi:10.1002/2016WR018845.
- Cotrufo, F., Boot, C., Kampf, S., Nelson, P., Brogan*, D., Covino, T., Haddix, M., MacDonald, L., **Rathburn, S.**, Ryan, S., Schmeer*, S., and Hall, E. 2016, Redistribution of pyrogenic carbon from hillslopes to stream corridors following a large montane wildfire, *Global Biogeochemical Cycles* 39(9):1348-1355, doi:10.1002/2016GB005467.
- Wohl, E., **Rathburn, S.**, Chignell*, S., Garrett*, K., Laurel*, D., Livers*, B., Patton*, A., Records*, R., Richards*, M., Schook*, D., Sutfin*, N., and Wegener*, P., 2016, Mapping longitudinal stream connectivity in the North St. Vrain Creek watershed of Colorado, *Geomorphology*, doi:10.1016/j.geomorph
- Grimsley*, K., **Rathburn, S.**, Friedman, J., and Mangano*, J., 2016, Debris flow occurrence and sediment persistence, Upper Colorado River Valley, Rocky Mountain National Park, *Environmental Management*: 58(1):76-92, doi:10.1007/s00267-016-0695-1

- Wohl, E., Bledsoe, B., Jacobson, R., Poff, N.L., **Rathburn, S.**, Walters, D., and Wilcox, A., 2015, The natural sediment regime in rivers: broadening the foundation for ecosystem management, *BioScience* 65:358-371.
- Rathburn, S.L.**, Rubin*, Z.K., and Wohl, E.E., 2013, Evaluating channel response to an extreme sedimentation event in the context of historical range of variability: Upper Colorado River, Rocky Mountain National Park, Colorado, *Earth Surface Processes and Landforms* 38:391-406, DOI:10.1002/esp.3329.
- Rubin*, Z.K., **Rathburn, S.L.**, Wohl, E.E., and Harry, D.H., 2012, Historic range of variability in geomorphic processes as a context for restoration: Rocky Mountain National Park, Colorado, *Earth Surface Processes and Landforms* 37:209-222, DOI:10.1002/esp.2249.
- Rathburn, S.L.**, and Weinberg*, A., 2011, Undergraduate student satisfaction and achievement at the GetWET Observatory: A fluid learning experience at Colorado State University, *Journal of Geoscience Education* 59:47-55.
- Cadol*, D.D., **Rathburn, S.L.**, and Cooper D.J., 2010, Aerial photographic analysis of channel narrowing and vegetation expansion in Canyon de Chelly National Monument, Arizona, USA, 1935-2004, *River Research and Applications* DOI:10.1002/rra.1399.
- Rathburn, S.L.**, Merritt, D.M., Wohl, E.E., Sanderson, J.A., and Knight, H.A.L., 2009, Characterizing environmental flows for maintenance of river ecosystems: North Fork Cache La Poudre River, Colorado, in James. L.A., Rathburn, S.L., and Whittecar, G.R., eds., *Management and Restoration of Fluvial Systems with Broad Historical Changes and Human Impacts*, Boulder, CO, Geological Society of America Special Paper 451:143-157, DOI:10.1130/2009.2451(10).
- Rathburn, S.L.**, 2004, Review of Roughness Characteristics of New Zealand Rivers by D. M. Hicks and P. D. Mason, *Journal of Hydraulic Engineering*, ASCE 130:6:593-594.
- Rathburn, S.L.**, and Wohl, E.E., 2003, Predicting fine sediment dynamics along a pool-riffle mountain channel, *Geomorphology* 55:1-4:111-124.
- Rathburn, S.L.**, and Wohl, E.E., 2003, Sedimentation hazards downstream from reservoirs, in Graf, W., ed., *Dam Removal Research: Status and Prospects*, 105-118.
- Wohl, E.E., and **Rathburn, S.L.**, 2003, Mitigation of sediment hazards downstream from reservoirs, *International Journal of Sediment Research* 18(2):97-106.
- Rathburn, S.L.**, and Wohl, E.E., 2001, One-dimensional sediment transport modeling of pool recovery along a mountain channel after a reservoir sediment release, *Regulated Rivers Research and Management* 17:251-273.
- Cerling, T.E., Poreda, J.J., and **Rathburn, S.**, 1994, Cosmogenic ^3He and ^{21}Ne age of the Big Lost River Flood, Snake River Plain, Idaho, *Geology* 22(3):227-330.
- Rathburn, S.L.**, 1993, Pleistocene cataclysmic flooding along the Big Lost River, east central Idaho, *Geomorphology* 8:305-319.
- Webb, R.H., and **Rathburn, S.L.**, 1988, Paleohydrologic research in the southwestern United States, *Transportation Research Record* 1201:9-21.

Edited Volumes:

- Wohl, E., Magilligan, F., and **Rathburn, S.**, 2016, Connectivity in Geomorphology from Binghamton 2016, *Geomorphology* 277:1-282.
- Wohl, E., and **Rathburn, S.L.**, 2013, Historical Range of Variability in a Geomorphic Context - Special, *Earth Surface Processes and Landforms*, DOI:10.1002/esp.3357.

James, L.A., **Rathburn, S.L.**, and Whittecar, G.R., 2009, *Management and Restoration of Fluvial Systems with Broad Historical Changes and Human Impacts*, Geological Society of America Special Paper 451, doi:10.1130/2009.2451.

Manuscripts in Progress:

Patton*, A., **Rathburn, S.**, Capps, D., and Brown*, R., in revision, Lithologic, geomorphic, and permafrost controls on landsliding in Denali National Park, Alaska, *Geosphere*.

Ryan, S., **Rathburn, S.**, and Dixon, M., in review, Stream sediment loads following compound landscape disturbances: Influences of the High Park Fire and Northern Colorado Flood, *Geomorphology*.

Richards*, M., **Rathburn, S.**, Booth, D., and Capps, D., in prep, Braided river response to human induced valley confinement and gravel mining, Toklat River, Denali National Park, AK, to be submitted to *Environmental Management*.

Patton*, A., **Rathburn, S.**, Capps, D., McGrath, D., and Brown, R., in prep, Landslide development in thawing permafrost, Denali National Park, to be submitted to *Landslides*

Eidmann*, J., **Rathburn, S.**, and Huson, K., in prep, Analyzing post-flood recovery after an extreme event: North St. Vrain Creek, CO, to be submitted to *Geology*.

Other Publications:

Patton*, A., **Rathburn, S.**, Capps, D., Ruleman, C., and Brown, R., 2019, Surficial geologic map of the Denali National Park and Preserve Road Corridor, 1:24,000, USGS EDMAP National Mapping Initiative.

Eidmann*, J., and **Rathburn, S.**, 2018, Tracking post-flood channel adjustments and reservoir sedimentation to inform water management practices, *Colorado Water*, 35(3):18-22.

Putman, J., and **Rathburn, S.**, 2018, Advising a clear pathway to high-impact practices with faculty partners, Academic Advising Today, National Association of Academic Advisors online publication <https://www.nacada.ksu.edu/Resources/Academic-Advising-Today/View-Articles/Advising-a-Clear-Pathway-to-High-Impact-Practices-with-Faculty-Partners.aspx>

Sparacino*, M., and **Rathburn, S.**, 2017, Effects of River Restoration on Surface Water-Groundwater Interactions, Upper Colorado River, Rocky Mountain National Park, *Colorado Water*, 34(3):33-36,

Miller, S., Rhodes, C., Robichaud, P., Ryan, S., Kovecses, J., Chambers, C., **Rathburn, S.**, Heath, J., Kampf, S., Wilson*, C., Brogan*, D., Piehl, B., Miller, M.E., Giordanengo, J., Berryman, E., and Rocca, M., 2017, Learn from the Burn: The High Park Fire 5 Years Later, *Science You Can Use Bulletin*, USFS Rocky Mountain Research Station, 25:1-8.

Rathburn, S. L., Ronayne, M., Kampf, S., and Laituri, M., 2013. Water Education in the Warner College of Natural Resources: Fostering Learning of our Watershed, *Colorado Water*, 30:2-6.

Rathburn, S.L., Meyer*, A., Ferrantelli*, Wilcox*, A., Cadol*, D., Kreiner*, D., and Birdsall*, T., 2009. Introductory Geology Laboratory Manual for CSU Students, Pearson Prentice Hall, Boston, MA, 155 p., 2nd edition.

Rathburn, S.L., Sanford, W.E., Harry, D.L., and Warnock, A.C., 2007. GetWET Observatory: A groundwater learning and teaching facility, *Colorado Water* 24:6-8.

Warnock, A.S., **Rathburn, S.L.**, and Thompson, S. 2004. Geology of Lory State Park, Colorado, Rocky Mountain Nature Association, 16 p.

MEETING ABSTRACTS (* indicates student co-author)

- Rathburn, S.**, Ryan, S., Eidmann*, J., and Patton*, P., 2019, Fires, floods, and debris flows: Understanding sediment flux, geomorphic impacts, and fluvial system recovery following disturbances, GSA Annual Meeting, Phoenix, AZ.
- Kemper*, J., **Rathburn, S.**, and Friedman, J., 2019, QGG Stanley A. Schumm Award: Floodplain forest establishment and legacy sediment within the Yampa River Basin, Northern CO, GSA Annual Meeting, Phoenix, AZ.
- Timilsina*, S., Niemann, J., **Rathburn, S.**, and Rengers, F., 2019, Modeling hydrologic processes associated with soil saturation and debris flow initiation during the September 2013 storm, Colorado Front Range, AGU Hydrology Days, Colorado State University, Fort Collins, CO.
- Rathburn, S.**, Patton*, A., and Bilderback, E., 2018, Historical debris-flow occurrence in Rocky Mountain National Park, CO, 7th International Conference on Debris-Flow Hazard Mitigation, Golden, CO, June 2019.
- Rathburn, S.**, and Eidmann*, J., 2018, Channel and delta response to export of 2013 Flood sediment and wood, North St. Vrain Creek, CO, AGU Annual Meeting, Washington DC.
- Anthony, R., Aster, R., Ryan, S., **Rathburn, S.**, Baker*, M., and Ringler, A., 2018, Fluvial seismology: Using seismograms to infer discharge, bedload and other river processes, AGU Annual Meeting, Washington DC.
- Timilsina*, S., Niemann, J., **Rathburn, S.**, and Rengers, F., 2018, Exploring hydrologic controls on patterns of debris flow initiation in the Colorado Front Range during the September 2013 Flood, AGU Annual Meeting, Washington DC.
- Rathburn, S.**, 2018, Shedding Sediment: Post-disturbance sediment recovery and resilience, GSA Annual Meeting, Indianapolis, IN.
- Patton*, A., **Rathburn, S.** and Capps, D., 2018, Morisawa Award: Landslide response to climate change in permafrost regions, GSA Annual Meeting, Indianapolis, IN.
- Eidmann*, J., **Rathburn, S.**, and Huson, K., 2018, Tracking the fate of sediment after an extreme flood, AGU Hydrology Days, Colorado State University, Fort Collins, CO.
- Eidmann*, J., **Rathburn, S.**, and Huson, K., 2017, Tracking the fate of sediment after an extreme flood, Rocky Mountain Hydrologic Research Center, 72nd Annual meeting, University of Colorado, Boulder, CO.
- Patton*, A., **Rathburn, S.**, Capps, D., Ruleman, C., 2017, Preliminary surficial mapping of the Denali National Park and Preserve Road Corridor: Implications for landslide hazards in a changing climate, GSA Abstracts with Program, vol. 49, no. 6, doi:10.1130/abs/2017AM-302437.
- Van*, B., Merrill*, J., and **Rathburn, S.**, , 2017, Wood loads and jam spacing on the Upper Colorado River, Rocky Mountain National Park, Celebrate Undergraduate Research and Creativity, Colorado State University, April 17.
- Bennett, G., Kean, J., Rengers, F., Ryan, S., and **Rathburn, S.**, 2017, Landslide-channel feedbacks amplify flood response and channel erosion, Geophysical Research Abstracts vol. 19, EGU General Assembly 2017.
- Rathburn, S.**, Bennett, G., L., and Wohl, E., 2016, The tumbling triumvirate: Quantifying flood-related sediment, wood and carbon, GSA Abstracts with Program, vol. 48, no. 7, doi:10.1130/abs/2016AM-280739 (invited speaker).

- Schook*, D., **Rathburn, S.**, Friedman, J., 2016, Variable channel migration rates over the past two centuries, Powder River, MT, GSA Abstracts with Programs, vol. 48, no. 7, doi:10.1130/abs/2016AM-281437.
- Patton*, A., **Rathburn, S.**, and Bilderback, E., 2016, Geochronology of debris flows near Bighorn Ranger Station, Rocky Mountain National Park, CO, GSA Abstracts with Program, vol. 48, no. 7, doi:10.1130/abs/2016AM-280489.
- Sparacino*, M., **Rathburn, S.**, and Singha, K., 2016, Monitoring the effects of river realignment on the Upper Colorado River, Rocky Mountain National Park, GSA Abstracts with Program, vol. 48, no. 7, doi:10/1130/abs/2016AM-282959.
- Ryan, S., Bennett, G., and **Rathburn, S.**, 2016, Complex response of channels in forested watersheds to floods: Assessing the geomorphic impacts of the 2013 Colorado Flood on national forest and park lands, GSA Abstracts with Program, vol. 48, no. 7, doi:10.1130/abs/2016AM-283016.
- Bennett, G., Rathburn, S., Ryan, S., Wohl, E., and Blair, A., 2016, Assessing the role of large wood entrained in the 2013 Colorado Front Range flood in ongoing channel response to reservoir management, Geophysical Research Abstracts vol. 18, EGU General Assembly 2016.
- Amponsah*, W., Righini*, M., Wohl, E., Borga, M., Marchi, L., **Rathburn, S.**, Surian, N., and Zocatelli, D., 2016, Geomorphically effective energy expenditure for quantifying channel responses to extreme floods, Geophysical Research Abstracts vol. 18, EGU General Assembly 2016.
- Rathburn, S.**, Comiti, F., Brardinoni, F., Sparacino*, M., and Schook*, D., 2015, Drainage basin sensitivity to climate change in the Eastern Italian Alps, EP33A-1047, AGU Abstracts with Program, AGU Annual Meeting, San Francisco, CA.
- Patton*, A., **Rathburn, S.**, and Bilderback, E., 2015, Upland processes and controls on September 2013 debris flows, Rocky Mountain National Park, CO, EP53A-0954A, AGU Abstracts with Program, AGU Annual Meeting, San Francisco, CA.
- Richards*, M., **Rathburn, S.**, Booth, D., Capps, D., 2015, Braided river response to eight decades of human disturbance, Toklat River, Denali National Park and Preserve, AK, EP33A-1041, AGU Abstracts with Program, AGU Annual Meeting, San Francisco, CA.
- Schook*, D., **Rathburn, S.**, and Friedman, J., 2015, A riparian approach to dendrochronological flow reconstruction, Yellowstone River, Montana, PP51A-225A, AGU Abstracts with Program, AGU Annual Meeting, San Francisco, CA.
- Rathburn, S.**, McElroy, B., Wohl, E., Sutfin*, N., and Huson, K., 2014, RAPID Assessment of extreme reservoir sedimentation resulting from the September 2013 Flood, North St. Vrain Creek, CO, EP32A-05, AGU Abstracts with Program, AGU Annual Meeting, San Francisco, CA.
- Schook*, D., Friedman, J., and **Rathburn, S.**, 2014, Using cottonwood dendrochronology to reconstruct river discharge and floodplain dynamics, Yellowstone River, Montana, AGU Abstracts with Program, EP51B-3525, AGU Annual Meeting, San Francisco, CA. (AGU Outstanding Student Paper Award).
- Shahverdian*, S., **Rathburn, S.L.**, Ryan, S., Dixon, M., and Writer, J. 2013. Mechanisms and Controls on Post-High Park Fire Sediment Delivery in the South Fork Cache la Poudre Basin: Preliminary Results, GSA Abstracts with Program, Vol. 45, No. 7, GSA Annual meeting, Denver, CO.

- Mangano*, J., and **Rathburn, S.L.**, 2013. Evaluating Channel Morphologic Changes and Quantifying Bed-material Transport using Airborne LiDAR, Upper Colorado River, Rocky Mountain National Park, CO, GSA Abstracts with Program, Vol. 47, No. 7, GSA Annual meeting, Denver, CO.
- Rathburn, S.L.**, Ronayne, M., Anderson, S., Smith, M, Caldwell, 2012. Contextual learning of surface and groundwater processes, GSA Abstracts with Program, Paper No. 123-9, Vol. 44, No. 7, p. 310, GSA Annual Meeting, Charlotte, NC.
- Rathburn, S.L.**, Grimsley*, K.J., and Rubin, Z.K., 2011. Sediment transport and bed material grain size distribution along the Upper Colorado River, Rocky Mountain National Park, CO, AGU Abstracts with Program, AGU Annual meeting, San Francisco, CA.
- Grimsley*, K.J., **Rathburn, S.L.**, and Grosicki, G., 2011. A debris flow chronology and an analysis of controls on debris flow occurrence in the Upper Colorado River Valley, CO, AGU Abstracts with Program, AGU Annual meeting, San Francisco, CA.
- Rathburn, S.L.**, Rubin*, Z.K., and Wohl, E.E., 2010. Quantifying fluvial processes along Lulu Creek and Colorado River: Planning for river restoration, Rocky Mountain National Park, Colorado, Annual Research Symposium, Rocky Mountain National Park, Estes Park, CO.
- Rathburn, S.L.**, and Rubin*, Z.K., 2009. Effects of the 2003 Grand Ditch Breach on Lulu Creek and the Colorado River, Rocky Mountain National Park, CO, GSA Abstracts with Program, GSA Annual Meeting, Portland, OR.
- Rathburn, S.L.**, Rubin*, Z., Henkle*, J., Cooper, D., Bobowski, B., VanMouwerik, M., and Wohl, E., 2008. Channel restoration planning for the Colorado River and Lulu Creek, Rocky Mountain National Park, Colorado River Basin Science and Resource Management Symposium, Scottsdale, AZ.
- Rathburn, S.L.**, Merritt, D.M., Wohl, E.E., Knight, H.A., and Sanderson, J., 2007. Streamflow and sediment management for maintenance of river ecosystems: North Fork Cache la Poudre River, Colorado, GSA Abstracts with Program, GSA Annual meeting, Denver, CO.
- Warnock, A.C., Viney, M.D., **Rathburn, S.L.**, Sanford, W.E., and Swartz, D., 2007. On the design of a classroom and field-based professional development course for key surface and groundwater concepts, GSA Abstracts with Program, GSA Annual meeting, Denver, CO.
- Rathburn, S.L.**, Warnock, A.C., Sanford, W.E, and Harry, D.L., 2006. The Colorado State University GetWET Observatory: a fluid learning environment promoting deeper understanding, GSA Abstracts with Program, GSA Annual meeting, Philadelphia, PA.
- Spence*, C., and **Rathburn, S.L.**, 2006. Site characterization of the GetWET Observatory at CSU, Research Experience for Undergraduates – Program in Water Research at Colorado State University Symposium, July 25.
- Cadol*, D., and **Rathburn, S.L.**, 2006. Aerial photographic analysis of riparian vegetation growth and channel change at Canyon de Chelly National Monument, Arizona, 1935-2004. AGU Hydrology Days, Fort Collins, Colorado.
- Cadol*, D., and **Rathburn, S.L.**, 2005. Aerial photographic analysis of historic riparian vegetation growth and channel change at Canyon de Chelly National Monument, Arizona: Preliminary results, AGU Abstracts with Program, AGU Annual Meeting, San Francisco, CA.

Other Roles at Professional Meetings, Workshops, and Seminars:

2019 Invited speaker, EGU Galileo Conference, Perturbations of earth surface dynamics caused by extreme events, Nepal, to be held Oct. 13-19.

- 2019 Invited speaker and field trip leader, 7th International Conference on Debris-Flow Hazards Mitigation (DFMH7), *Historical debris-flow occurrence in Rocky Mountain National Park, CO*, Golden, CO, June 9-13.
- 2018 Invited speaker, Session T59: Human Alterations to Landscape Connectivity, GSA Annual Meeting, *Shedding Sediment: Post-disturbance sediment recovery and resilience*, Indianapolis, IN, Nov. 2018.
- 2018 Invited presentation, Session EP002: Advances in Incorporating Geomorphology and Flooding – Feedbacks and Impacts on Flood Risk, *Channel and delta response to export of 2013 Flood sediment and wood, North St. Vrain Creek, CO*, AGU Annual Meeting, Washington DC, Dec, 2018.
- 2018 Co-convener, Session EP021: The Role and Relevance of Thresholds, Event Variability, and Disturbances across Landscapes, AGU Annual meeting, Washington, D.C., Dec. 2018.
- 2018 Invited speaker, 13th Hydrologic Sciences Symposium, *By water, land and air: Tracking the fate of 2013 Flood sediment and wood, North St. Vrain Creek, CO*, CU Boulder, April 2018.
- 2017 Invited speaker, 48th Annual Binghamton Geomorphology Symposium, Resilience and Bio-Geomorphologic Systems, *Post-disturbance sediment recovery: Implications for watershed resilience*, Texas State University, Oct. 2017.
- 2017 Invited visiting professor, The Free University of Bozen-Bolzano, Italy, *Glaciers-to-Rivers Sediment Transfer in Alpine Basins*, Sept. 2017.
- 2016 Invited speaker, Session T62: Quantifying the Geomorphic Response to Floods, GSA Annual Meeting, Denver, CO, Sept. 2016.
- 2016 Convener, Session on Restoration and Management of Fluvial Systems, GSA Annual Meeting, Denver, CO, 2016.
- 2015 Invited speaker, University of Colorado, Colorado Springs, *Debris flow occurrence in Rocky Mountain National Park, CO*, Oct. 2015.
- 2014 Invited speaker, Poudre River Forum: Working River, Healthy River, *Flow: The master variable that shapes, maintains, and supports rivers*, Feb. 2014.
- 2014 Convener, Restoration Workshop, Upper CO River, Rocky Mountain National Park, 14 participants, Sept. 19-20, 2014.
- 2014 Invited participant, Developing sustainable networks of women scientists for addressing issues of disasters related to weather and changing climate, COACH Program, Jamaica, Oct. 2014.
- 2013 Invited workshop leader, University of Colorado, NSF Cutting Edge: *Preparing for an Academic Career in the Geosciences: Workshop for Graduate Students and Post-Doctoral Fellows*, July 7-10, 2013.
- 2012 Invited speaker, University of Northern Colorado, *Historical range of variability as a context for landscape restoration: Upper CO River*, Sept. 2012.
- 2012 Invited speaker, University of Oregon, *Controls on sediment transport following an extreme sedimentation event, Upper CO River*, Feb. 2012.
- 2010 Invited speaker, University of Vermont, *Channel stability in a changing landscape: Planning for restoration of Lulu Creek and Colorado River, Rocky Mountain National Park*, Dec. 2010.
- 2010 Co-leader, Kirk Bryan Field trip, Historical Range of Variability in the Colorado Rockies, GSA Annual Meeting, Denver, CO, Nov. 2010.

- 2010 Co-convenor, topical session on Historical Range of Variability in Landscapes, GSA Annual Meeting, Denver, CO, Nov. 2010.
- 2010 Invited speaker, *Critical thinking and learning in Natural Resources for undergraduates*, The Institute for Learning and Teaching Summer Conference on Learning, Teaching, and Critical Thinking, May 19, 2010.
- 2009 Invited speaker, University of Cincinnati, *Channel stability in a changing landscape: Planning for restoration of Lulu Creek and Colorado River, Rocky Mountain National Park*, April 2009.
- 2008 Invited speaker, *Critical thinking: Does it vary across the disciplines?*, The Institute for Learning and Teaching Summer Conference on Learning, Teaching, and Critical Thinking, May 21, 2008.
- 2008 Co-leader, Classroom and Field Strategies for Teaching Key Surface and Groundwater Concepts, GetWET Teacher Training Workshop with American Ground Water Trust, July 30-31, 2008.
- 2008 Professional Development Institute, Colorado State University, Innovative Testing Strategies, Jan. 2008.
- 2007 Invited panelist 'Balancing Career and Family', Association of Women Geoscientists Annual Meeting, Oct. 2007.
- 2007 Co-convenor, topical session on Management and Restoration of Fluvial Systems with Broad Historical Changes and Human Impacts, GSA Annual Meeting, Denver, CO, Oct. 2007.
- 2007 Invited speaker, *Fluvial processes in dryland rivers*, Nuclear Regulatory Commission, ACNW, March 2007.
- 2006 Convenor, topical session on Watershed-based Approaches to River Restoration, GSA Annual Meeting, Philadelphia, PA, Oct. 2006.

GRANTS

Funded Projects as PI

- US Department of Interior, US Geological Survey, Channel Change and Floodplain Forest Establishment in the Colorado River Basin, 2018-2019, \$34,999.
- US Department of Interior, National Park Service, Cottonwood Forest Establishment along the Green and Yampa Rivers, 2018-2020, \$42,299.
- US Department of Interior, US Geological Survey, EDMAP, Detailed Surficial Mapping of Major Mass Movement Deposits and Adjacent Bedrock along the Park Road Corridor, Denali National Park and Preserve, AK, 2018-2019, \$17,481
- US Department of Interior, Denali National Park and Preserve, Mass Movement Response to Climate Change in Denali National Park, AK, 2017-2019, \$24,996
- City of Longmont, Post-Flood Sediment and Wood Flux into Ralph Price Reservoir, North St. Vrain Creek, CO, 2017-2019, \$47,136
- US Department of Interior, National Park Service, Wood Loading and Jam Characteristics Following Disturbances on the Upper Colorado River, Rocky Mountain National Park, 2015-2018, \$15,203
- US Department of Interior, Rocky Mountain National Park, Electrical Resistivity Imaging for Phase I Effectiveness Monitoring: Upper Colorado River, 2015-2016, \$2,401

US Department of Interior, Rocky Mountain National Park, Phase I Restoration Design, Implementation and Effectiveness Monitoring, Upper Colorado River, 2015-2017, \$83,402; Addendum of \$9946, ending 2018.

CSU Water Center Multidisciplinary Research: Flow, Sediment Transport and Nutrient Flux Monitoring using Seismic and Infrasound Signals, 2015-2016, \$23,794

NSF Catalyzing New International Collaborations, US-Italy Research Project Development on Alpine Mountain Drainage Basin Response to Climatic Warming, 2014-2017, \$73,742

NSF GLD Collaborative Research: RAPID Assessment of 2013 Flood Sedimentation, Button Rock Reservoir, North St. Vrain Watershed, CO, 2013-2016, \$11,475

US Forest Service, Rocky Mountain Research Station, and Cities of Fort Collins and Greeley, Mechanisms and Controls on Post-Fire Sediment Delivery: The High Park burn in South Fork Cache la Poudre Basin, 2013-2015, \$70,402

US Geological Survey, Reconstructing Flow and Climate History of the Yellowstone River, Eastern MT, using Cottonwood Dendrochronology, 2013-2015, \$43,448

US Department of Interior, National Park Service, Upland Processes and Controls on September 2013 Mass Movements, RMNP, 2013-2015, \$67,836

US Department of Interior, National Park Service, Assessing the Annual Sediment Budget, Toklat River, Denali National Park, AK, 2013-2015, \$68,267

US Department of Interior, National Park Service, Evaluating River Morphologic Changes for Restoration Planning, Design, and Monitoring using Airborne LiDAR, Upper Colorado River, 2012-2014, \$55,410

US Geological Survey, Dendrochronologic Research on Western Rivers, 2011-2012, \$34,745

Warner College of Natural Resources Mini-grant, Fostering Learning of Water (FLOW) in WCNR Students, 2012-2013, \$10,000

US Department of Interior, Rocky Mountain National Park, Hydrologic and Sediment Transport Monitoring during 2011 and 2012: Planning for Channel Restoration along Lulu Creek and the Colorado River, 2011-2012, \$29,119

US Department of Interior, National Park Service, Developing a Debris Flow Chronology and Assessing Controls on Debris Flow Occurrence along the Upper Colorado River, 2010-2013, \$18,000

US Department of Interior, Rocky Mountain National Park, Establishing a Context for River Restoration along the Upper Colorado River in Rocky Mountain National Park, 2009-2010, \$30,783

US Department of Interior, Rocky Mountain National Park, Channel restoration planning and preparation for Lulu Creek and the Colorado River, Rocky Mountain National Park, 2008-2009, \$27,783

Warner College of Natural Resources Mini-grant, Upgrade and Modernize the Surface Water Monitoring Station at the GetWET Observatory, 2007-2008, \$9,850

NSF, Division of Undergraduate Education, GetWET Observatory: A Fluid Learning Environment for Undergraduates, 2006-2009, \$136,000

CSU, The Institute for Learning and Teaching Course Redesign Initiative, Effective Assessment of GCC120 Student Learning within the Affective Domain, 2006-2007, \$10,103

US Department of Agriculture, US Forest Service, Analytical framework for assessing effects of stream hydrology on fish habitat and riparian vegetation on mountain streams in Western US, 2006-2008, \$35,000

US Department of Interior, Rocky Mountain National Park, Channel restoration of Lulu Creek and the Colorado River, Phase II, 2004-2005, \$28,497

US Department of Interior, Rocky Mountain National Park, Channel restoration of Lulu Creek and the Colorado River, Rocky Mountain National Park, 2003-2004, \$ 12,737

US Department of Interior, Rocky Mountain National Park, Sediment transport and deposition within the Colorado River resulting from the Spring 2003 Grand Ditch Failure, Rocky Mountain National Park, 2003-2004, \$23,700

City of Fort Collins and North Poudre Irrigation Co., Sediment budget for Halligan Reservoir, North Fork Cache la Poudre River, 2001-2005, \$12,037

Pending Proposals

Warner College of Natural Resources, Geologic and Geomorphologic Analysis of the South Fork Cache la Poudre River Valley at the CSU Mountain Campus, with S. Fassnacht (co-PI), \$9508

NSF – GLD, Collaborative Research: Arroyo Incision: Pay Dirt for Downstream Floodplain Forests, \$250,715

Funded Projects as Co-PI

WCNR Natural Resource Research: Geologic and Geomorphologic Assessment of the South Fork Cache la Poudre River Valley at the Mountain Campus, S. Fassnacht, \$3275

NSF – GLD Connectivity in Geomorphology: The 47th Annual Binghamton Geomorphology Symposium, 2015-2017, E. Wohl and F. Magilligan, \$42,000

Warner College of Natural Resources Mini-grant, Pingree Park Hydro-meteorological Installation, 2009, S. Fassnacht, S. Kampf, \$10,000

NSF, Research Experience for Undergraduates – Program in Water Research at Colorado State University, J. Ramirez, 2006-2009

RESEARCH COLLABORATORS

Erich Mueller, Stephanie Kampf, Jonathan Friedman, Mike Scott, Georgina Bennett, Sandra Ryan, Ellen Wohl, Brandon McElroy, Mike Ronayne, Christy Briles, Kamini Singha, Francesco Comiti, David Dust, Francesco Brardinoni, Eric Bilderback, Ken Huson, Denny Capps, Rick Aster, Tim Covino, Francesca Cotrufo, Cal Ruleman, Francesco Midityeri

GRADUATE STUDENTS, POST-DOCS AND VISITING STUDENTS

Christoph Suhr –MS (current)

Celeste Wieting – PhD (current)

John Kemper – PhD (current)

Stanley A. Schumm Research Award and GSA Student Research Grant

SW Climate Adaptation Science Center Natural Resources Workforce Fellowship

Colorado Water Institute Grant

American Water Resources Association Award

Warner Graduate Research Award

Annette Patton – PhD 2019 (Post-doc, University of Oregon)
Editor’s Choice Award, ESPL 2018
GSA John & Carol McGill Award and Marie Morisawa Student Research Awards
Warner Graduate Research Award; GSA Student Research Grant

Johanna Eidmann – MS 2018 (PhD student with Sean Gallen, Geosciences, CSU)
Colorado Water Institute Grant
American Water Resources Association Awards

Matthew Sparacino – MS 2017 (Leonard Rice Engineers, Inc., Denver, CO)
Colorado Water Institute Grant
American Water Resources Association Awards

Derek Schook – PhD 2017, NSF IGERT Fellow (Post-doc National Park Service Ft. Collins, CO)
GSA Student Research Grant
Outstanding Student Paper Award, AGU Annual Meeting, Dec. 2014

Georgina Bennett – Post-doctoral Fellow 2015-2016, co-funded with S. Ryan, USFS (Faculty, University of East Anglia)

Mariah Richards – MS 2016 (Inter-Fluve, Hood River, OR)
Arthur D. Howard Award and GSA Student Research Grant

Annette Patton – MS 2016 (PhD student CSU)
Purdue PRIME Lab Seed Grant

Francesco Mditieri – Visiting PhD student, University of Salerno, Italy 2015-2016

Scott Shahverdian – MS 2015 (USU –Ecogeomorphology & Topographic Analysis Lab)
USFS National Fire Plan Grant
City of Fort Collins, CO Grant

Joseph Mangano – MS 2014 (USGS Boise, ID)
GSA Student Research Grant

Cory Williams – MS 2014 (USGS Grand Junction, CO)
USGS Graduate Research Assistantship

Kyle Grimsley – MS 2012 (Leidos Consulting – Washington DC)
GSA Student Research Grant

Zan Rubin – MS 2010 (PhD - UC Berkeley; Balance Hydrologics Inc., Berkeley, CA)
GSA Student Research Grant

Dan Cadol – MS 2007 (Associate Professor, New Mexico Tech)
NPS Graduate Research Assistantship

UNDERGRADUATE STUDENT RESEARCH

Sara Newman, Iliana Ingamellis, Sarah Lowe, Anthony Mainiero, Breanna Van, Jay Merrill, Tavon Bowman, Benjamin Rodwell, Brandon Elba, Fisher Ankney, Thomas Luckie, Geoff Lee, Rafael Rivera, Austin Best, David Weber, Todd Green, Joseph Orlando

SYNERGISTIC ACTIVITIES

Professional Service

Co-host, 47th Annual Binghamton Geomorphology Symposium, Connectivity in Geomorphology, E. Wohl and F. Magilligan, Colorado State University, Sept. 2016.
Chair, Geological Society of America Quaternary Geology and Geomorphology Division, 2011-2012; 1st Vice Chair 2010-2011; 2nd Vice Chair 2009-2010
Panelist GSA Quaternary Geology and Geomorphology Division, 2005-2007

Grant and Award Review Panels

Colorado State University Provost's Course Redesign Competition Review, 2008
Colorado State University Graduate Teaching Certificates Review Board, 2007-present

NSF, Dynamics of Coupled Natural and Human Systems, 2015

NSF, Division of Undergraduate Education/CCLI Phase I Panel Review, 2007

NSF, Division of Undergraduate Education/CCLI Phase II Panel Review, 2008

GSA Quaternary Geology and Geomorphology Division

- Kirk Bryan Award; Gladys Cole Award; Distinguished Career Award; J. Hoover Mackin & Arthur Howard Student Awards; Student research proposal review (2011, 2015, 2018)

Grant Refereeing

National Science Foundation, Hydrologic Sciences Division, Geomorphology and Land Use Dynamics Division, Faculty Early Career Development, and Division of Undergraduate Education, Course, Curriculum, and Laboratory Improvement

USDA National Institute of Food and Agriculture

Editorial Roles and Manuscript Refereeing

Associate Editor Water Resources Research (2018-present); Environmental Management Review Board (2016-present)

Earth Surface Processes and Landforms, Geological Society of America Bulletin, GSA Geology, Water Resources Research, Geomorphology, Journal of Geoscience Education, River Research and Applications, Environmental Management, American Society of Civil Engineers Journal of Hydrologic Engineering, Environmental Management, Bioscience, Annals of the American Association of Geographers, 7th International Debris-Flow Hazards Mitigation volume

SELECTED SERVICE AND OUTREACH

WCNR Mentoring Representative; Mentoring Facilitator Training (CIMER)

CSU Graduate Center for Inclusive Mentoring (GCIM) representative

Member, University Task Force on Institutional Learning Objectives (ILOs)

Chair, Search Committee for Assistant Professor in Critical Zone Geoscience

Scholarship and Awards, Curriculum Committees in Geosciences Department

Search Committees, IT Director; Watershed Hydrologist; Hydrogeologist

Master Teacher for Warner College of Natural Resources

MOOC lecturer, *Rivers after Fire*

Invited Speaker, Water Tables 2013, CSU Water Resources Archive

Udall Scholarship Faculty Mentor

Faculty Sponsor CSU Cycling Team; Rowing Crew Team

First Tracks Orientation at CSU's Mountain Campus

Expert witness for National Park Service

Invited Speaker, Science Behind the Scenery, Centennial Celebration, RMNP

Invited Speaker, Wild and Scenic Film Festival, Larimer County Conservation Corps

Invited speaker, Optimist Club, *Rivers after Fire*, and *Colorado Geology*

Volunteer, Animal Shelter, dog foster care

Volunteer, The Nature Conservancy

Volunteer, Dunn Elementary, 2nd grade writer's workshop

Creativity, Action and Service (CAS) advisor for Poudre High School Seniors
Volunteer Trout Unlimited Summer Fly Fishing Camp

Media Coverage

CSU Annual 1870 Dinner, February 9, 2019, *Writing Our Story*,
https://www.youtube.com/watch?v=QM_dh7YjhLY&feature=youtu.be

NPR Podcast, September 19, 2018, Flood Waters Fundamentally Changed the Front Range – In Landscape and Human Tragedy by Luke Runyon <http://www.kunc.org/post/flood-waters-fundamentally-changed-front-range-landscape-and-human-tragedy#stream/0>

Scientific American 60-Second Science by Julia Rosen
<https://www.scientificamerican.com/podcast/episode/extreme-storms-are-extreme-eroders/>
Featured in Rocky Mountain National Park Centennial Celebration Video *Wilderness, Wildlife, Wonder*– by Fall River Productions

Rocky Mountain National Park Post-Flood Research video
<https://www.nps.gov/rlc/continentaldivide/current-research.htm>
Coloradoan article on post-flood research, with Bryony Wardell, 2014

WCNR Department of Geosciences video
<https://www.youtube.com/watch?v=7mN1WBkndaI&feature=youtu.be>