

# Peter A. Nelson

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## Education

- Ph.D., Earth and Planetary Science, 2010  
University of California, Berkeley, CA
- B.S.E., *summa cum laude*, Civil and Environmental Engineering, 2003  
Certificate in Environmental Studies  
Princeton University, Princeton, NJ

## Positions

- 2018 – Associate Professor of Civil and Environmental Engineering, Colorado State University
- 2012 – 2018 Assistant Professor of Civil and Environmental Engineering, Colorado State University
- 2011 – 2012 NSF International Postdoctoral Fellow, Department of Civil and Environmental Engineering, University of Genoa, Italy
- 2004 – 2010 Graduate Student Researcher and Instructor, Department of Earth and Planetary Science, University of California, Berkeley
- 2003 – 2004 Research Assistant, Department of Civil and Environmental Engineering, Princeton University

## Honors

- Arthur Thomas Ippen Award (Honorable Mention), 2023, International Association of Hydraulic Researchers (IAHR)
- Faculty Award for Excellence in Service, Colorado State University Dept. of Civil and Environmental Engineering, 2022
- Borland Chair of Hydraulics, Colorado State University Dept. of Civil and Environmental Engineering, 2019-2022
- Meroney Family Chi Epsilon Faculty Teaching Award, 2019
- Yevjevich Award, Colorado State University Dept. of Civil and Environmental Engineering, 2015
- National Science Foundation Faculty Early Career Development (CAREER) Award, 2015-2020
- Editor's Citation for Excellence in Refereeing, *Journal of Geophysical Research Earth Surface*, 2014
- National Science Foundation International Research Fellowship, 2011-2012
- Outstanding GSI Award, UC Berkeley, 2009
- National Science Foundation Graduate Research Fellowship, 2005-2009
- Phi Beta Kappa, 2003
- Sigma Xi, 2003
- W. Taylor Thom prize in geological engineering, Princeton University, 2003
- Environmental Studies Thesis Prize, Honorable Mention, Princeton University, 2003
- Tau Beta Pi, 2002
- Outstanding Academic Achievement in the BSE Program, Princeton University, 1999-2003
- National Merit Scholar, 1999

- Robert C. Byrd Honors Scholarship, 1999-2003

### **Refereed Publications**

(\* indicates student author)

43. \*Cho, J and **PA Nelson**, 2024, Patterns of Alluviation in Mixed Bedrock-Alluvial Channels: 2. Controls on the Formation of Alluvial Patches, *Journal of Geophysical Research: Earth Surface*, 129(1), e2023JF007293, <https://doi.org/10.1029/2023JF007293>
42. \*Cho, J and **PA Nelson**, 2024, Patterns of Alluviation in Mixed Bedrock-Alluvial Channels: 1. Numerical Model, *Journal of Geophysical Research: Earth Surface*, 129(1), e2023JF007292, <https://doi.org/10.1029/2023JF007292>
41. \*White, DC, RR Morrison, and **PA Nelson**, 2023, Experimental observations of floodplain vegetation, bedforms, and sediment transport interactions in a meandering channel, *Journal of Geophysical Research: Earth Surface* 128, e2023JF007136. <https://doi.org/10.1029/2023JF007136>
40. \*Gieschen, M and **PA Nelson**, 2023, Untangling the Effects of Seasonality and Post-Fire Stream Channel Erosion on the Hydrologic Response of a Burned Mountain Catchment, *Hydrological Processes* 37:e14968, doi: <https://doi.org/10.1002/hyp.14968>
39. \*White, DC and **PA Nelson**, 2023, Flume investigation of bed morphology, flow field, and bed load transport as mechanisms responsible for particle sorting in gravel-bed meandering channels, *Journal of Geophysical Research: Earth Surface*, e2022JF006821, doi: 10.1029/2022JF006821
38. \*Scamardo, J, **PA Nelson**, M Nichols, and E Wohl, 2022, Modeling the relative morphodynamic influence of vegetation and large wood in a dryland ephemeral stream, Arizona, USA, *Geomorphology*, 417, 108444, doi: 10.1016/j.geomorph.2022.108444.
37. \*Murphy, BM, KL Russell, S Mould, G Vietz, and **PA Nelson**, 2022, Managing urban riverscapes: An assessment framework to integrate social-ecological values and physical processes, *Journal of Environmental Management*, 322, 115862, doi: 10.1016/j.jenvman.2022.115862.
36. Li, T, JG Venditti, CD Rennie, and **PA Nelson**, 2022, Bed and bank stress partitioning in bedrock rivers, *Journal of Geophysical Research: Earth Surface*, doi: 10.1029/2021JF006360.
35. \*Morgan, JA and **PA Nelson**, 2021, Experimental investigation of flow and sediment supply effects on riffle-pool sequences, *Earth Surface Processes and Landforms*, 46(4), 869-886, doi: 10.1002/esp.5072.
34. Tullis, D, RH Hotchkiss, **PA Nelson**, and D Wegner, 2021, Sediment mismanagement puts reservoirs and ecosystems at risk, *Eos*, 14 April 2021, <https://eos.org/opinions/sediment-mismanagement-puts-reservoirs-and-ecosystems-at-risk>
33. \*Timilsina, S, JD Niemann, SL Rathburn, FK Rengers, and **PA Nelson**, 2021, Modeling hydrologic processes and debris flow initiation during the September 2013 storm, Colorado Front Range, *Landslides*, doi: 10.1007/s10346-020-04582-5.
32. Kampf, SK, BM Gannon, \*C Wilson, \*F Saavedra, ME Miller, A Heldmyer, B Livneh, **P Nelson**, and L MacDonald, 2020, PEMIP: Post-fire erosion model inter-comparison project, *Journal of Environmental Management*, 268, doi: 10.1016/j.jenvman.2020.110704.
31. \*Morgan, JA and **PA Nelson**, Morphodynamic modeling of sediment pulse dynamics, 2019, *Water Resources Research*, 55, 8691-8707, doi: 10.1029/2019WR025407

30. \*Brogan, DJ, **PA Nelson**, and LH MacDonald, 2019, Spatial and temporal patterns of sediment storage and erosion following a wildfire and extreme flood, *Earth Surface Dynamics* 7, 563-590, doi: 10.5194/esurf-7-563-2019.
29. \*Brogan, DJ, LH MacDonald, **PA Nelson**, and JA Morgan, 2019, Geomorphic complexity and sensitivity in channels to fire and floods in mountain catchments, *Geomorphology* 337, 53-68, doi: 10.1016/j.geomorph.2019.03.031.
28. Annandale, GW, TJ Randle, EJ Langendoen, RH Hotchkiss, and the **United States National Reservoir Sedimentation and Sustainability Team (NRSST)**, 2018, Reservoir sedimentation management: A sustainable development challenge, *Hydrolink*, Number 3, 72-75.
27. **Nelson, PA** and \*JA Morgan, 2018, Flume experiments on flow and sediment supply controls on gravel bedform dynamics, *Geomorphology*, 323, 98-105, doi: 10.1016/j.geomorph.2018.09.011.
26. \*Bankert, A and **PA Nelson**, 2017, Alternate bar dynamics in response to increases and decreases of sediment supply, *Sedimentology*, doi: 10.1111/sed.12399.
25. \*Brogan DJ, **PA Nelson**, and LH MacDonald, 2017, Reconstructing extreme post-wildfire floods: a comparison of convective and mesoscale events, *Earth Surface Processes and Landforms*, doi: 10.1002/esp.4194.
24. \*Stroth, TR, BP Bledsoe, and **PA Nelson**, 2017, Full spectrum analytical channel design with the Capacity/Supply Ratio (CSR), *Water*, 9(4), 271, doi: 10.3390/w9040271.
23. \*Rosburg TT, **PA Nelson**, and BP Bledsoe, 2017, Effects of urbanization on flow-duration and stream flashiness: A case study of Puget Sound streams, Western Washington, USA, *JAWRA: Journal of the American Water Resources Association (JAWRA)*, 53(2), 493-507, doi: 10.1111/1752-1688.12511.
22. \*Morgan JA, \*DJ Brogan, and **PA Nelson**, 2017, Application of structure-from-motion in laboratory flumes, *Geomorphology*, 276, 125-143, doi: 10.1016/j.geomorph.2016.10.021.
21. Cotrufo, MF, CM Boot, S Kampf, **PA Nelson**, \*DJ Brogan, T Covino, ML Haddix, LH MacDonald, S Rathburn, S Ryan-Burkett, \*S Schmeer, and E Hall, 2016, Redistribution of pyrogenic carbon from hillslopes to stream corridors following a large montane wildfire, *Global Biogeochemical Cycles*, 30, 1348-1355, doi: 10.1002/2016GB005467.
20. Kampf, SK, \*DJ Brogan, \*S Schmeer, LH MacDonald, and **PA Nelson**, 2016, How do geomorphic effects of rainfall vary with storm type and spatial scale in a post-fire landscape? *Geomorphology*, 273, 39-51, doi: 10.1016/j.geomorph.2016.08.001.
19. \*Rosburg, TT, **PA Nelson**, \*JS Sholtes, and BP Bledsoe, 2016, The effect of flow data resolution on sediment yield and channel design, *Journal of Hydrology*, 538, 429-439, doi: 10.1016/j.jhydrol.2016.04.040.
18. Fuller, TK, JG Venditti, **PA Nelson**, and WJ Palen, 2016, Modeling grain size adjustments in the downstream reach following run-of-river development, *Water Resources Research*, 52, 2770-2788, doi: 10.1002/2015WR017992.
17. **Nelson, PA**, RR McDonald, JM Nelson, and WE Dietrich, 2015, Coevolution of bed surface patchiness and channel morphology: 2. Numerical experiments. *Journal of Geophysical Research: Earth Surface*, doi: 10.1002/2014JF003429.
16. **Nelson, PA**, RR McDonald, JM Nelson, and WE Dietrich, 2015, Coevolution of bed surface patchiness and channel morphology: 1. Mechanisms of forced patch formation. *Journal of Geophysical Research: Earth Surface*, doi: 10.1002/2014JF003428.

15. **Nelson, PA**, \*AK Brew, and \*JA Morgan, 2015, Morphodynamic response of a variable-width channel to changes in sediment supply, *Water Resources Research*, doi: 10.1002/2014WR016806.
14. **Nelson, PA**, M Bolla Pittaluga, and G Seminara, 2014, Finite amplitude bars in mixed bedrock-alluvial channels, *Journal of Geophysical Research: Earth Surface*, doi: 10.1002/2013JF002957.
13. **Nelson, PA**, D Bellugi, and WE Dietrich, 2014, Delineation of river bed-surface patches by clustering high-resolution spatial grain size data, *Geomorphology*, doi:10.1016/j.geomorph.2012.06.008.
12. Venditti, JG, **PA Nelson**, JT Minear, J Wooster, and WE Dietrich, 2012, Alternate bar response to sediment supply termination, *Journal of Geophysical Research*, 117, F02039, doi:10.1029/2011JF002254.
11. **Nelson, PA** and G Seminara, 2012, A theoretical framework for the morphodynamics of bedrock channels, *Geophysical Research Letters*, L06408, doi:10.1029/2011GL050806.
10. **Nelson, PA** and G Seminara, 2011, Modeling the evolution of bedrock channel shape with erosion from saltating bed load, *Geophysical Research Letters*, L17406, doi:10.1029/2011GL048628.
9. **Nelson, PA**, WE Dietrich, and JG Venditti, 2010, Bed topography and the development of forced bed surface patches, *Journal of Geophysical Research*, F04024, doi:10.1029/2010JF001747.
8. Venditti, JG, WE Dietrich, **PA Nelson**, MA Wydzga, J Fadde, and L Sklar, 2010, Effect of sediment pulse grain size on sediment transport rates and bed mobility in gravel bed rivers, *Journal of Geophysical Research*, F03039, doi: 10.1029/2009JF001418.
7. Venditti, JG, WE Dietrich, **PA Nelson**, MA Wydzga, J Fadde, and L Sklar, 2010, Mobilization of coarse surface layers in gravel-bedded rivers by finer gravel bedload, *Water Resources Research*, W07506, doi: 10.1029/2009WR008329.
6. Sklar, LS, J Fadde, JG Venditti, **P Nelson**, MA Wydzga, Y Cui, and WE Dietrich, 2009, Translation and dispersion of sediment pulses in flume experiments simulating gravel augmentation below dams, *Water Resources Research*, W08439, doi:10.1029/2008WR007346.
5. **Nelson, PA**, JG Venditti, WE Dietrich, JW Kirchner, H Ikeda, F Iseya, and LS Sklar, 2009, Response of bed surface patchiness to reductions in sediment supply, *Journal of Geophysical Research*, F02005, doi:10.1029/2008JF001144.
4. **Nelson, PA**, JA Smith, and AJ Miller, 2006, Evolution of channel morphology and hydrologic response in an urbanizing drainage basin, *Earth Surface Processes and Landforms* 31: 1063-1079, doi:10.1002/esp.1308.
3. Smith, JA, ML Baeck, KL Meierdiercks, **PA Nelson**, AJ Miller, and EJ Holland, 2005, Field studies of the storm event hydrologic response in an urbanizing watershed, *Water Resources Research* 41, W10413, doi:10.1029/2004WR003712.
2. Smith, JA, AJ Miller, ML Baeck, **PA Nelson**, GT Fisher, and KL Meierdiercks, 2005, Extraordinary flood response of a small urban watershed to short-duration convective rainfall, *Journal of Hydrometeorology* 6: 599-617, doi: 10.1175/JHM426.1.
1. Hicks, NS, JA Smith, AJ Miller, and **PA Nelson**, 2005, Catastrophic flooding from an orographic thunderstorm in the central Appalachians, *Water Resources Research* 41, W12428, doi:10.1029/2005WR004129.

### **Submitted Papers**

## **Datasets**

2. Cho, Jongseok, & Nelson, Peter. (2023). Patterns of Alluviation in Mixed Bedrock-Alluvial Channels [Data set]. Zenodo. <https://doi.org/10.5281/zenodo.8357267>
1. Gieschen, M. (2022). Skin Gulch Hydrograph Separation, HydroShare, <http://www.hydroshare.org/resource/b4a918d0417043bf9b317da48a266499>

## **Peer-Reviewed Book Chapters, Reports, and Conference Proceedings Papers**

11. \*Murphy, BM and **PA Nelson**, 2020, Urban stream assessment procedure: An integrative framework for assessing stream condition and the urban environment, *River Flow 2020*, Uijttewaai, W, MJ Franca, D Valero, V Chavarrias, CY Arbos, R Schielen, and A Crosato (eds), CRC Press, Boca Raton, pp. 2119-2127
10. LH MacDonald, \*D Brogan, **PA Nelson**, and S Kampf, 2019, Fires and Floods: A Case Study of the Relative Magnitude and Persistence of Geomorphic Effects at the Watershed Scale, SEDHYD 2019, Reno, NV, 24-28 June.
9. **Nelson, PA** and N Tambroni, 2017, Indagini numeriche sulla morfodinamica delle barre alternate in canali in marea, in *Atti dell'Istituto Veneto di Scienze, Lettere, ed Arti*, D'Alpaos, L (ed), Istituto Veneto di Scienze, Lettere, ed Arti, Venice, pp. 3-28.
8. Venditti, JG, **PA Nelson**, RW Bradley, D Haught, and AB Gitto, 2017, Bedforms, structures, patches, and sediment supply in gravel-bed rivers, *Gravel-Bed Rivers: Processes and Disasters*, Tsutsumi, D and JB Laronne (Eds), John Wiley & Sons, Chichester, 439-466.
7. McDonald RR, JM Nelson, R Fosness, and **PA Nelson**, 2016, Field scale test of multi-dimensional flow and morphodynamic simulations used for restoration design analysis, *River Flow 2016*, Constantinescu, Garcia, and Hanes (Eds), Taylor and Francis Group, London, 1390-1398.
6. \*Morgan JA and **PA Nelson**, 2016, Hydro- and morphodynamics of riffle-pool sequences in the middle Elwha River, Washington, USA, *River Flow 2016*, Constantinescu, Garcia, and Hanes (Eds), Taylor and Francis Group, London, 1212-1217.
5. Bledsoe, BP, DW Baker, **PA Nelson**, \*JS Sholtes, \*TT Rosburg, and \*T Stroth, 2016, Design hydrology for stream restoration and channel stability at stream crossings, Final Report for NCHRP Project 24-40.
4. \*Brew, AK, \*JA Morgan, and **PA Nelson**, 2015, Bankfull width controls on riffle-pool morphology under conditions of increased sediment supply: field observations during the Elwha River Dam Removal Project, SEDHYD 2015, Reno, Nevada, 19-23 April.
3. Venditti, JG, **PA Nelson**, and WE Dietrich, 2008, The domain of bedload sheets. In Parsons, D, T Garlan, and J Best (eds), *Proceedings of Marine and River Dune Dynamics III, International Workshop*, April 1-3 2008, University of Leeds, UK, 315-321.
2. Clarke, J, M Bourke, **P Nelson**, M Manga, and J Fonseca, 2007, The Dalhousie mound spring complex as a guide to Martian landforms, processes, and exploration. In Mann, G (ed), *Proceedings of the 7<sup>th</sup> Australian Mars Exploration Conference*, Mars Society Australia, Clifton Hill, Victoria.

1. Dietrich, WE, **PA Nelson**, E Yager, JG Venditti, MP Lamb, and L Collins, 2005, Sediment patches, sediment supply, and channel morphology. In Parker, G and MH Garcia (eds), *River, Coastal and Estuarine Morphodynamics: RCEM 2005*, 79-90.

### **Theses**

2. **Nelson, PA**, 2010, Bed surface patchiness in gravel-bed rivers, Ph.D. thesis, University of California, Berkeley.
1. **Nelson, PA**, 2003, Evolution of hydrologic response and channel morphology in an urban drainage basin in the Maryland Piedmont, B.S.E. thesis, Princeton University.

### **Magazine Articles and Other Publications**

1. **Nelson, PA**, 2018, Flooding and sedimentation following the 2012 High Park Fire, *Colorado Water*, 35(2), 26-29.
2. Bankert, A\*, **PA Nelson**, and C Myrick, 2017, Smoothed-particle hydrodynamics: a new fluid modeling technique applied to analyze fish passage opportunities in whitewater park structures in Lyons, Colorado, *Colorado Water*, 34(5), 10-13.

### **Abstracts and Presentations**

(\* indicates student author)

105. **Nelson, PA**, SK Kampf, \*L Hayter, and \*J Murray, 2023, What controls watershed-scale erosion and deposition after wildfire? Insights from repeat UAV imagery of the 2020 Cameron Peak and East Troublesome Fires in Colorado. Abstract EP13B-08 presented at the 2023 Fall Meeting, AGU, 11-15 December.
104. \*White, DC, RR Morrison, **PA Nelson**, and H Uno, 2023, Modeling the impacts of floodplain vegetation flow resistance on river corridor hydrologic connectivity. Abstract EP42B-01 presented at the 2023 Fall Meeting, AGU, 11-15 December.
103. **Nelson, PA** and \*J Cho, 2023, Numerical simulations of alluvial patterns in mixed bedrock-alluvial channels, 13<sup>th</sup> Symposium on River, Coastal and Estuarine Morphodynamics RCEM 2023, Urbana, IL, 25-28 Sept.
102. **Nelson, PA**, \*L Hayter, and \*J Murray, 2023, Mapping watershed-scale topographic change after wildfire with repeat UAV photogrammetry, ASCE Hydraulic Measurements and Experimental Methods Conference, Fort Collins, CO, 26-29 June.
101. \*Murray, JT and **PA Nelson**, 2023, Remote Sensing of Geomorphic Change In Mulched and Unmulched Watersheds Burned In The 2020 East Troublesome Fire, Colorado, SEDHYD 2023, St. Louis, MO, 8-12 May. <https://www.sedhyd.org/2023Program/1/226.pdf>
100. \*Hayter, L, and **P Nelson**, 2023, Evaluating Post-Fire Geomorphic Change On Paired Mulched and Unmulched Watersheds Using Repeat Drone Surveys, SEDHYD 2023, St. Louis, MO, 8-12 May. <https://www.sedhyd.org/2023Program/1/57.pdf>
99. \*White, P., F Rengers, K Barnhart, and **P Nelson**, 2023, Exploring The Applicability of Radar-Based Quantitative Precipitation Estimates For Emergency Assessment of Post-Wildfire Debris Flow Hazards In Colorado, SEDHYD 2023, St. Louis, MO, 8-12 May. <https://www.sedhyd.org/2023Program/1/55.pdf>

98. \*White, D, R Morrison, and **P Nelson**, 2023, Experimental Observations of Flow and Bed Morphology In A Meandering Compound Channel With Variable Density Floodplain Vegetation, SEDHYD 2023, St. Louis, MO, 8-12 May. <https://www.sedhyd.org/2023Program/1/240.pdf>
97. \*White, P and **PA Nelson**, 2023, Evaluation of sub-hourly Quantitative Precipitation Estimates in Colorado's mountains using machine learning, Hydrology Days 2023, Fort Collins, CO, 21-22 March.
96. \*White, DC, RR Morrison, and **PA Nelson**, 2022, Experimental observations of flow in a compound meandering channel with varied floodplain vegetation density, Abstract EP35C-1351 presented at the 2021 Fall Meeting, AGU, 12-16 December.
95. \*White, DC, RR Morrison, and **PA Nelson**, 2022, Bed morphology in an experimental meandering compound channel with varied floodplain vegetation density, Abstract 165-3 presented at the Geological Society of America Annual Meeting, Denver, 10-14 October.
94. \*Cho, J and **PA Nelson**, 2022, Numerical study on sediment transport and alluviation in mixed bedrock alluvial channels, Hydrology Days 2022, Fort Collins, CO, 20-22 March.
93. \*White, DC, RR Morrison, and **PA Nelson**, 2022, Fluvial response in a meandering headwater stream one year after wildfire, Hydrology Days 2022, Fort Collins, CO, 20-22 March.
92. Li, T, J Venditti, C Rennie, and **P Nelson**, 2021, Bed and Bank Stress Partitioning in Bedrock Rivers, Abstract EP45F-1568 presented at the 2021 Fall Meeting, AGU, 13-17 December.
91. White, DC, **PA Nelson**, and RR Morrison, 2021, Experimental observations of flow, sediment transport, and channel morphology in meandering channels with varied floodplain vegetation density, Abstract EP25C-1331 presented at the 2021 Fall Meeting, AGU, 13-17 December.
90. **Nelson, PA**, 2021, Evaluation of Handheld Apple iPad Lidar for Measurements of Topography and Geomorphic Change, Abstract H45T-1419 presented at the 2021 Fall Meeting, AGU, 13-17 December.
89. \*Brouillard, N, \*D White, **PA Nelson**, and RR Morrison, 2020, Effects of floodplain vegetation on hydraulics and sediment transport in compound meandering channels and implications for river restoration, Abstract EP043-02 presented at the 2020 Fall Meeting, AGU, 1-17 December.
88. \*Byron, E, **PA Nelson**, and JD Niemann, 2020, Probabilistic modeling of landslide initiation and runoff mapping under current and future climates, Abstract NH030-0007 presented at the 2020 Fall Meeting, AGU, 1-17 December.
87. \*Cortese, D and **PA Nelson**, 2020, Multi-scalar response of an experimental fixed-wall meandering channel to a sediment supply increase, Abstract EP012-0014 presented at the 2020 Fall Meeting, AGU, 1-17 December.
86. \*Cho, J and **PA Nelson**, 2020, Numerical simulation of dynamic alluvial patterns in mixed bedrock-alluvial channels, Abstract EP012-0021 presented at the 2020 Fall Meeting, AGU, 1-17 December.
85. \*Murphy, B, KL Russell, **PA Nelson**, and G Vietz, 2020, Urban stream assessment frameworks: Stream flow impacts, geomorphic responses, and stream values, Abstract H053-08 presented at the 2020 Fall Meeting, AGU, 1-17 December.
84. \*Murphy, B and **P Nelson**, 2020, Integrated assessment of the physical condition of urban streams, 5<sup>th</sup> Symposium on Urbanization and Stream Ecology, Austin, TX, 12-15 February.

83. \*White, D and **PA Nelson**, 2019, Experimental observation of sediment sorting mechanisms in meandering gravel-bedded channels, Abstract EP51E-2134 presented at the 2019 Fall Meeting, AGU, San Francisco, CA, 9-13 December.
82. \*Murphy, B and **PA Nelson**, 2019, Urban Stream Assessment Procedure (USAP): A Framework for Assessing Stream Health in the Urban Environment, Abstract EP22B-11 presented at the 2019 Fall Meeting, AGU, San Francisco, CA, 9-13 December.
81. **Nelson, PA** and \*D White, 2019, Using High-Resolution Topography to Quantify Bed Surface Patchiness, Form Roughness, and Grain Roughness in an Experimental Meandering Gravel-Bed Channel, Abstract EP41B-08 presented at the 2019 Fall Meeting, AGU, San Francisco, CA, 9-13 December.
80. MacDonald, LH, \*D Brogan, **P Nelson**, J Wagenbrenner, and S Kampf, 2019, Scaling Post-fire Effects from Hillslopes to Watersheds: Processes, Problems, and Implications, SEDHYD 2019, Reno, NV, 24-28 June.
79. MacDonald, LH \*D Brogan, **P Nelson**, and S Kampf, 2019, Fires and Floods: A Case Study of the Relative Magnitude and Persistence of Geomorphic Effects at the Watershed Scale, SEDHYD 2019, Reno, NV, 24-28 June.
78. \*Brown, RA, **PA Nelson**, and \*D White, 2019, Experimental investigation of channel curvature and sediment supply controls on the morphology and surface grain sorting of meandering gravel-bed rivers, SEDHYD 2019, Reno, NV, 24-28 June.
77. MacDonald, L, \*D Brogan, **P Nelson**, and S Kampf, 2019, Runoff, Erosion, and Channel Changes from Fires and Floods: Comparisons Over Time and Across Spatial Scales, *Geophysical Research Abstracts*, 21, EGU2019-11978.
- White, D, D Cortese, R Brown, and PA Nelson, 2019, Sorting patterns in curved channels: Flume experiment observations, Hydrology Days 2019, Fort Collins, CO, 27-29 March.
76. \*Brown RA and **PA Nelson**, 2019, Curvature and Sediment Supply Controls in Gravel Channels, River Restoration Northwest, Stevenson, WA, 4-7 February.
75. MacDonald, LH, \*D Brogan, **PA Nelson**, S Kampf, and JW Wagenbrenner, 2018, Scaling post-fire effects from hillslopes to watersheds: Processes, problems, and implications, Hydrology Days 2018, Fort Collins, CO, 19-21 March.
74. \*Queen, RW and **PA Nelson**, 2018, Morphodynamic numerical modeling of sediment transport and deposition around run-of-river dams, Hydrology Days 2018, Fort Collins, CO, 19-21 March.
73. **Nelson, PA** and \*JA Morgan, 2017, Flow, sediment supply, and channel width controls on gravel bedform dynamics, Abstract EP41A-1831 presented at the 2017 Fall Meeting, AGU, New Orleans, LA, 11-15 Dec.
72. \*Morgan, JA, **PA Nelson**, and \*DJ Brogan, 2017, Hydro-geomorphology of the middle Elwha River, Washington, following dam removal, Abstract EP33D-07 presented at the 2017 Fall Meeting, AGU, New Orleans, LA, 11-15 Dec.
71. \*Brogan, DJ, **PA Nelson**, LH MacDonald, and \*JA Morgan, 2017, Geomorphic complexity of sequential fire and floods in mountain watersheds, Abstract EP51E-06 presented at the 2017 Fall Meeting, AGU, New Orleans, LA, 11-15 Dec.
70. \*Brown, RA and **PA Nelson**, 2017, Stratigraphic feedbacks on alternate bar morphology, RCEM2017 Back to Italy, 10<sup>th</sup> Symposium on River, Coastal, and Estuarine Morphodynamics, Trento-Padova, Italy, 15-22 September, p. 49.



69. **Nelson, PA** and \*RA Brown, 2017, Numerical experiments on the effect of channel curvature and unsteady flow on bed morphology and bed-surface sorting, RCEM2017 Back to Italy, 10<sup>th</sup> Symposium on River, Coastal, and Estuarine Morphodynamics, Trento-Padova, Italy, 15-22 September, p. 230.
68. \*Hardee, TL, **PA Nelson**, MC Kondratieff, and BP Bledsoe, 2017, Evaluation of fish passage at whitewater parks using 2D and 3D hydraulic modeling, Rocky Mountain Stream Restoration Conference, Breckenridge, Colorado, 27-29 June.
67. Kampf, S, L MacDonald, F Saavedra, C Wilson, S Schmeer, \*D Brogan, **P Nelson**, and B Gannon, 2017, Erosion and sediment delivery to streams following wildfire: Processes and predictions, UCOWR/NIWR Annual Conference, Fort Collins, CO, 13-15 June.
66. \*Morgan, JA and **PA Nelson**, 2017, Two-dimensional modeling of variable-width gravel bed morphodynamics, CSDMS Annual Meeting 2017: Modeling Coupled Earth and Human Systems – The Dynamic Duo, Boulder, CO, 23-25 May.
65. **Nelson, PA** and \*RA Brown, 2017, Stratigraphic feedbacks on free and forced alternate bar morphology, JpGU-AGU Joint Meeting, Chiba, Japan, 20-25 May.
64. **Nelson, PA** and \*AR Bankert, 2017, Alternate bar dynamics in response to increases and decreases of sediment supply, Sediment Experimentalist Network Workshop, Tsukuba, Japan, 18-19 May.
63. Cotrufo, MF, C Boot, S Kampf, L MacDonald, **P Nelson**, and E Hall, 2017, Pyrogenic carbon redistribution from hillslopes to stream corridors following a large montane wildfire, *Geophysical Research Abstracts*, 19, EGU2017-18270.
62. \*Schoelkopf, A, \*JA Morgan, and **PA Nelson**, 2017, Bedload sheet characteristics under steady versus unsteady flow, Hydrology Days 2017, Fort Collins, CO, 20-22 March.
61. \*Bankert, AR and **PA Nelson**, 2017, Alternate bar dynamics in response to increases and decreases of sediment supply, Hydrology Days 2017, Fort Collins, CO, 20-22 March.
60. \*Cho, J and **PA Nelson**, 2017, Numerical simulation of alluviation in bedrock channels, Hydrology Days 2017, Fort Collins, CO, 20-22 March.
59. \*Hardee, TL, **PA Nelson**, MC Kondratieff, and BP Bledsoe, 2017, Evaluation of fish passage at whitewater parks using 2D and 3D hydraulic modeling, Hydrology Days 2017, Fort Collins, CO, 20-22 March.
58. \*Brogan, DJ, **PA Nelson**, LH MacDonald, and \*JA Morgan, 2017, How disturbing: The complications of sequential fire and floods in mountain catchments, Hydrology Days 2017, Fort Collins, CO, 20-22 March.
57. \*Morgan, JA, **PA Nelson**, and \*DJ Brogan, 2017, Morphological changes in the middle Elwha River, Washington following dam removal, Hydrology Days 2017, Fort Collins, CO, 20-22 March.
56. \*Brown, RA and **PA Nelson**, 2017, Stratigraphic feedbacks on alternate bar morphology, Hydrology Days 2017, Fort Collins, CO, 20-22 March.
55. \*Brogan DJ, **PA Nelson**, and LH MacDonald, 2016, How do watershed characteristics and precipitation influence post-wildfire valley sediment storage and delivery over time?, Abstract H43G-1551 presented at 2016 Fall Meeting, AGU, San Francisco, Calif., 12-16 Dec.
54. MacDonald LH, JW Wagenbrenner, PR Robichaud, **PA Nelson**, SK Kampf, and \*DJ Brogan, 2016, Fires: Pushing the reset button or a flash in the pan?, Abstract H42A-08 presented at 2016 Fall Meeting, AGU, San Francisco, Calif., 12-16 Dec.

53. \*Brown R and **PA Nelson**, 2016, Stratigraphic feedbacks on alternate bar morphology, Abstract EP54B-04 presented at 2016 Fall Meeting, AGU, San Francisco, Calif., 12-16 Dec.
52. \*Hardee T, **PA Nelson**, M Kondratieff, and BP Bledsoe, 2016, Evaluation of fish passage at whitewater parks using 2D and 3D hydraulic modeling, Abstract EP53D-1001 presented at 2016 Fall Meeting, AGU, San Francisco, Calif., 12-16 Dec.
51. \*Morgan JA and **PA Nelson**, 2016, Numerical and physical experiments on the effect of variations in channel width on gravel-bed river morphodynamics, Abstract EP51A-0862 presented at 2016 Fall Meeting, AGU, San Francisco, Calif., 12-16 Dec.
50. \*Brogan DJ, **PA Nelson**, and LH MacDonald, 2016, How do watershed characteristics influence post-fire sediment storage and delivery over time?, Paper No. 302-4, GSA Annual Meeting, Denver, Colorado.
49. \*Morgan JA and **PA Nelson**, 2016, Numerical simulations on the effect of variations in channel width on the morphodynamics of gravel-bed rivers, Paper No. 94-11, GSA Annual Meeting, Denver, Colorado.
48. \*Hanson T and **PA Nelson**, 2016, Sorting in gravel bed channels under varying degrees of meandering and sediment supply, Hydrology Days 2016, Fort Collins, CO, 21-23 March.
47. \*Gieschen M and **PA Nelson**, 2016, Storm event hydrograph separation at nested spatial scales in Skin Gulch, Northern Colorado, Hydrology Days 2016, Fort Collins, CO, 21-23 March.
46. \*Morgan JA and **PA Nelson**, 2016, Morphodynamics of riffle-pool sequences in the middle Elwha River, Washington, Hydrology Days 2016, Fort Collins, CO, 21-23 March.
45. \*Bankert AR and **PA Nelson**, 2016, The effects of sediment supply and self-formed stratigraphy on alternate bar morphodynamics, Hydrology Days 2016, Fort Collins, CO, 21-23 March.
44. MacDonald, LH, S Kampf, \*D Brogan, S Schmeer, and **P Nelson**, 2016, Comparing and linking post-fire hillslope erosion and channel change for different storm types, *Geophysical Research Abstracts*, 18, EGU2016.
43. \*Morgan, JA and **PA Nelson**, 2015, Numerical experiments on sediment pulse dynamics, Abstract EP31D-06 presented at 2015 Fall Meeting, AGU, San Francisco, Calif., 14-18 Dec.
42. \*Brogan, DJ, **PA Nelson**, and LH MacDonald, 2015, Quantifying erosion and deposition patterns using airborne LiDAR following the 2012 High Park Fire and 2013 Colorado Flood, Abstract EP51B-0911 presented at 2015 Fall Meeting, AGU, San Francisco, Calif., 14-18 Dec.
41. **Nelson, PA**, \*T Rosburg, and BP Bledsoe, 2015, The effect of urbanization on flow duration curves: A case study from selected streams in the Puget Sound Basin, Western Washington, Abstract H13S-04 presented at 2015 Fall Meeting, AGU, San Francisco, Calif., 14-18 Dec.
40. \*Morgan JA and **PA Nelson**, 2015, Geomorphic changes in riffle-pool sequences of the middle Elwha River, 2015 Elwha River Science Symposium, Port Angeles, WA.
39. **Nelson, PA** and \*JA Morgan, 2015, Numerical experiments on the effects of channel width, unsteady flow, and sediment supply on gravel-bed river morphodynamics, Gravel Bed Rivers 8, Kyoto and Takayama, Japan, 14-18 Sept.
38. **Nelson, PA**, RR McDonald, JM Nelson, and WE Dietrich, 2015, Numerical experiments on the coevolution of alternate bars and forced bed surface patches, RCEM 2015, Iquitos, Peru, 31 Aug – 3 Sept.

37. \*Morgan, JA and **PA Nelson**, 2015, Numerical experiments on the effects of channel width, unsteady flow, and sediment supply on gravel-bed river morphodynamics, Hydrology Days 2015, Fort Collins, CO, 23-25 March.
36. \*Rosburg, T, **PA Nelson**, and BP Bledsoe, 2015, The effect of urbanization on flow duration curves: A case study from selected streams in the Puget Sound Basin, Western Washington, Hydrology Days 2015, Fort Collins, CO, 23-25 March.
35. Boot, CM, MF Cotrufo, ML Haddix, S Schmeer, S Kampf, \*D Brogan, **P Nelson**, CC Rhoades, S Ryan-Burkett, S Rathburn, and EK Hall, 2015, Transport of black carbon across the terrestrial-aquatic interface following wildfire: contributions of short and long-term controls, Hydrology Days 2015, Fort Collins, CO, 23-25 March.
34. \*Brogan, DJ, **PA Nelson**, and LH MacDonald, 2015, Estimating and comparing two extreme post-wildfire peak flows in the Colorado Front Range, Hydrology Days 2015, Fort Collins, CO, 23-25 March.
33. Boot, CM, MF Cotrufo, ML Haddix, S Schmeer, SK Kampf, \*DJ Brogan, **PA Nelson**, C Rhoades, SE Ryan, SL Rathburn, and E Hall, 2014, Transport of Black Carbon Across the Terrestrial-Aquatic Interface Following Wildfire: Contributions of Short and Long-term Controls, Abstract B41L-06 presented at 2014 Fall Meeting, AGU, San Francisco, Calif., 15-19 Dec.
32. Fuller, TK, JG Venditti, **PA Nelson**, V Popescu, and W Palen, 2014, Modeling changes in bed surface texture and aquatic habitat caused by run-of-river hydropower development, Abstract EP32A-04 presented at 2014 Fall Meeting, AGU, San Francisco, Calif., 15-19 Dec.
31. Kampf, SK, S Schmeer, LH MacDonald, \*DJ Brogan, and **PA Nelson**, 2014, Flooding after fire: Impacts of the 2013 Colorado Front Range floods on the High Park Fire burn scar, Abstract H54D-08 presented at 2014 Fall Meeting, AGU, San Francisco, Calif., 15-19 Dec.
30. **Nelson, PA**, G Seminara, and M Bolla Pittaluga, 2014, Morphodynamic theory of sediment distribution in mixed bedrock-alluvial channels, Abstract EP34B-05 presented at 2014 Fall Meeting, AGU, San Francisco, Calif., 15-19 Dec.
29. \*Brogan, DJ and **PA Nelson**, 2014, A hydrologic and geomorphic comparison of two extreme post-wildfire floods in the Colorado Front Range, Rocky Mountain Hydrologic Research Center Annual Meeting, Allenspark, CO 14 Oct.
28. \*Brew, AK, \*JA Morgan, and **PA Nelson**, 2014, Analysis of variations in channel width and sediment supply on riffle pool dynamics, before and after dam removal, Hydrology Days 2014, Fort Collins, CO, 24-26 March.
27. \*Brogan, DJ, **PA Nelson**, and LH MacDonald, 2013, Reconstruction of a geomorphically-effective flood following the 2012 High Park Fire, Geological Society of America annual meeting, Denver, CO, 27-30 October.
26. \*Brogan, DJ, **PA Nelson**, and LH MacDonald, 2013, Erosion, deposition, and stream channel response after the 2012 High Park Fire, in Moody, JA and DA Martin (eds), *Collected abstracts for AGU Chapman conference: Synthesizing Empirical Results to Improve Predictions of Post-wildfire Runoff and Erosion Responses*, 25-31 August 2013, p. 39.
25. Bolla-Pittaluga, M, R Luchi, D Aramini, **P Nelson**, and G Seminara, 2013, Rational approach to fluvial morphodynamic equilibrium: the Magra River, Italy, The 8<sup>th</sup> Symposium on River Coastal and Estuarine Morphodynamics (RCEM 2013), Santander, Spain, 9-13 June.
24. MacDonald, LH, J Wagenbrenner, **P Nelson**, and \*D Brogan, 2013, Predicting post-fire flooding and sediment delivery at the watershed scale: an urgent need for upscaling, *Geophysical Research Abstracts*, 15, EGU2013-41-1.

23. **Nelson, PA** and G Seminara, 2013, Progress in the morphodynamics of bedrock-alluvial rivers, Hydrology Days 2013, Fort Collins, CO, 25-27 March.
22. \*Brogan, DJ, S Schmeer, SK Kampf, LH MacDonald, and **PA Nelson**, 2013, Quantification of post-fire hydrologic response, hillslope erosion, and channel morphology: baseline data following the High Park Fire, Hydrology Days 2013, Fort Collins, CO, 25-27 March.
21. **Nelson, PA**, G Seminara, and M Bolla-Pittaluga, 2012, Finite amplitude bars in mixed bedrock-alluvial river channel bends, Abstract EP13A-0822 presented at 2012 Fall Meeting, AGU, San Francisco, Calif., 3-7 Dec.
20. Schmeer, S, \*D Brogan, S Kampf, L MacDonald, **P Nelson**, and S Rathburn, 2012, Erosion, channel change, and sediment transport following the High Park Fire, poster presented at High Park Fire Symposium, Sept. 10, 2012, Fort Collins, CO.
19. **Nelson, PA**, N Tambroni, and G Seminara, 2011, Morphodynamic simulation of alternate bars in tidal channels, Abstract EP52B-06 presented at 2011 Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.
18. **Nelson, PA**, RR McDonald, JM Nelson, and WE Dietrich, 2011, Numerical experiments on the coevolution of bed surface patchiness and channel morphology, *Geophysical Research Abstracts*, 13, EGU2011-4325.
17. **Nelson, PA**, D Bellugi, and WE Dietrich, 2010, Objective delineation of river bed surface patches from high-resolution spatial grain size data, Abstract EP53A-0606 presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.
16. D Bellugi, **Nelson, PA** and WE Dietrich, 2010, Automatic river bed grain size measurement using image processing and support vector machines, Abstract EP53A-0603 presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.
15. **Nelson, PA**, WE Dietrich, and JG Venditti, 2008, Bed topography and the development of forced bed surface patches, *Eos Trans. AGU*, 89(53), Fall Meet. Suppl., Abstract H52C-04.
14. **Nelson, PA** and G Seminara, 2007, Sediment supply and the prediction of bedrock cross section evolution, *Eos Trans. AGU*, 88(52), Fall Meet. Suppl., Abstract H44B-04.
13. Dietrich, WE, **PA Nelson**, EM Yager, MP Lamb, and J Venditti, 2007, Persistence and transience in bed surface texture, *Eos Trans. AGU*, 88(52), Fall Meet. Suppl., Abstract H53L-01.
12. **Nelson, PA**, M Manga, MC Bourke, and JDA Clarke, 2007, A model for mound spring formation and evolution, *Lunar and Planetary Science XXXVIII*, Abstract #2111.
11. Bourke, MC, J Clarke, M Manga, **P Nelson**, K Williams, J Fonesca, and B Fobar, 2007, Spring mounds and channels at Dalhousie, Central Australia, *Lunar and Planetary Science XXXVIII*, Abstract #2174.
10. Venditti JG, JT Minear, **PA Nelson**, J Wooster, and WE Dietrich, 2006, Response of alternate bar topography to variation in sediment supply in gravel-bedded rivers, *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstract H51G-0583.
9. Wooster, JK, JG Venditti, JT Minear, Y Cui, S Dusterhoff, R Humphries, **P Nelson**, W Dietrich, and L Sklar, 2006, Investigations of sediment pulse morphodynamics in a flume with fixed bars, *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstract H51G-5084.

8. **Nelson, PA**, JG Venditti, and WE Dietrich, 2006, Response of bed surface patchiness to reductions in sediment supply, *4<sup>th</sup> Biennial CALFED Science Conference*, Sacramento, CA, 23-25 October 2006.
7. **Nelson, PA**, JG Venditti, and WE Dietrich, 2005, Response of bed surface patchiness to reductions in sediment supply, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., Abstract H51H-04.
6. Venditti, JG, WE Dietrich, **PA Nelson**, AM Wydzga, J Fadde, and L Sklar, 2005, Can coarse surface layers in gravel-bedded rivers be mobilized by finer gravel bedload? *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., Abstract H51H-05.
5. Fadde, J, JG Venditti, LS Sklar, A Wydzga, **PA Nelson**, and WE Dietrich, 2005, Propagation of sediment pulses in flume experiments simulating gravel augmentation in armored channels downstream of dams, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., Abstract H53D-0487.
4. Smith, JA, AJ Miller, NS Hicks, **PA Nelson**, and ML Baeck, 2004. Hydraulics of a catastrophic flood in a small Central Appalachian watershed. *Eos Trans. AGU*, 85(47), Fall Meet. Suppl., Abstract H13F-0472.
3. Smith, JA, AJ Miller, K Meierdiercks, ML Baeck, **P Nelson**, E Holland, J Diehl, and M Ballantine, 2003. Extreme floods in urban drainage basins. *Eos Trans. AGU*, 84(46), Fall Meet. Suppl., Abstract H12D-1019.
2. Miller, AJ, JA Smith, ML Baeck, **PA Nelson**, E Holland, KL Meierdiercks, JO Diehl, and M Ballantine, 2003. High-magnitude short-duration floods in small urban watersheds. *Eos Trans. AGU*, 84(46), Fall Meet. Suppl., Abstract H31C-0482.
1. **Nelson, PA**, JA Smith, and AJ Miller, 2003. Applications of 2D hydraulic modeling in the Baltimore Ecosystem. Baltimore Ecosystem Study Annual Meeting, Baltimore, MD, 16 October 2003.

### Invited Lectures

- University of Illinois Urbana-Champaign, Earth Science and Environmental Change Colloquium, January 2024
- Front Range Roundtable, December 2021
- University of Northern Colorado, Earth and Atmospheric Sciences Seminar, November 2021
- Colorado State University, Water Engineering and Science Seminar, September 2021
- Colorado State University, Water Engineering and Science Seminar, February 2019
- University of Colorado, Water Resources Engineering Seminar, October 2018
- University of Genoa, Department of Civil and Environmental Engineering, June 2015 (declined)
- Colorado State University, Department of Civil and Environmental Engineering, April 2015
- American Geophysical Union Fall Meeting, December 2014
- Colorado Water Institute Interdisciplinary Water Resources Seminar, May 2014
- Colorado State University, Department of Geosciences, November 2013
- National Park Service, Water Resources Division, July 2013
- Simon Fraser University, Department of Geography, November 2012
- University of Genoa, Department of Civil and Environmental Engineering, July 2012
- University of San Francisco, Department of Environmental Science, April 2012
- Colorado State University, Department of Civil and Environmental Engineering, February 2012
- University of Washington, Department of Earth and Space Sciences, February 2012
- George Washington University, Department of Civil and Environmental Engineering, January 2012
- University of California, Berkeley, Department of Earth and Planetary Science, January 2011

### Media Appearances and Interviews

2023

- CBS Local, “Historic Colorado wildfires of 2020 still threatening communities and rivers years later”, <https://www.cbsnews.com/colorado/news/historic-colorado-wildfires-2020-still-threatening-communities-rivers/>
- Denver Post, “How wildfires are threatening Colorado water supplies — and costing lots of money”, <https://www.denverpost.com/2023/07/28/colorado-wildfire-water-quality-supply-sediment/>

## 2022

- 9News Denver, Researchers study whether mulch can help prevent flash floods after wildfires, <https://www.9news.com/article/news/local/wildfire/burn-scars-susceptible-to-floods/73-43fa683d-d08e-49e9-b844-13364bce625f>

## 2021

- KOA Radio, CSU Professor Dr. Peter Nelson on Burn Scars, Mudslides, and Floods, <https://koacolorado.iheart.com/featured/colorado-s-morning-news/content/2021-06-30-csu-professor-dr-peter-nelson-on-burn-scars-mudslides-and-floods/>

## Affiliations

- American Geophysical Union
- American Society of Civil Engineers
- International Association of Hydraulic Researchers (IAHR)

## Honor Societies

- Sigma Xi, 2003
- Tau Beta Pi, 2002
- Phi Beta Kappa, 2003

## Service

### *National/Professional*

- Associate Editor, *Water Resources Research*, 2024-present.
- Ford Foundation Fellowships Panelist (Ecology, Evolutionary, and Environmental Sciences), National Academies of Sciences, Engineering, and Medicine, 2021.
- Colorado Water Institute (CWI) representative on the SEDHYD Sedimentation Committee, 2020 – present.
  - Member of the National Reservoir Sedimentation Team.
- Colorado Water Institute (CWI) representative on the Subcommittee on Sedimentation (SOS) of the Advisory Committee on Water Information (ACWI), 2013 – 2020.
  - Member of the Task Committee on Reservoir Sedimentation.
  - Member of the National Reservoir Sedimentation Team.
- Article reviewer for
  - *Journal of Hydraulic Engineering*
  - *Geology*
  - *Geophysical Research Letters*
  - *Journal of Hydrology*
  - *Journal of Geophysical Research: Earth Surface*
  - *Earth Surface Processes and Landforms*
  - *Geomorphology*
  - *Water Resources Research*
  - *Journal of the American Water Resources Association (JAWRA)*
  - *Catena*
  - *Icarus*
  - *Environmental Engineering Science*

- *Geological Quarterly*
- *Science of the Total Environment*
- *Proceedings of the National Academy of Science*
- *GSA Bulletin*
- *Journal of Hydraulic Research*
- *Water*
- *Earth Surface Dynamics*
- *Physical Geography*
- *International Journal of River Basin Management*
- *Hydrological Processes*
- *Frontiers in Earth Science*
- *Geoscientific Instrumentation Methods and Data Systems*
- *Advances in Water Research*
- *International Journal of Wildland Fire*
- *Journal of Environmental Management*
- *River Research and Applications*
- *Limnology and Oceanography: Methods*
- Proposal reviewer for
  - NSF EAR (Geomorphology and Land-use Dynamics; Hydrologic Sciences; EAR Postdoctoral Fellowship Program)
  - NSF Major Research Instrumentation program
  - American Chemical Society Petroleum Research Fund
  - NWO (Netherlands Organization for Scientific Research)
  - FONDECYT (Chile Science, Technology, Knowledge, and Innovation Ministry's National Research and Development Agency).
- Co-chair of session "Morphodynamics of mixed bedrock alluvial channels," 2013 AGU Fall meeting.
- Co-organizer of the annual Gilbert Club geomorphology meeting, 2004-2010
- Moderator of the Gilbert Club email listserv, 2009-2011

#### *Department*

- Member of the Hydraulic Engineering Faculty Search Committee, Department of Civil and Environmental Engineering, Colorado State University, 2023-24.
- Chair of the Hydraulic Engineering / Environmental Fluid Mechanics Faculty Search Committee, Department of Civil and Environmental Engineering, Colorado State University, 2022-2023.
- Member of the Hydrologic Science and Engineering Faculty Search Committee, Department of Civil and Environmental Engineering, Colorado State University, 2021-2022.
- Organizer of the Water Engineering and Science Seminar Series, Department of Civil and Environmental Engineering, Colorado State University, Spring 2020, Fall 2021, Spring 2022.
- Member of the Strategic Task Force for Water Faculty Lines, Department of Civil and Environmental Engineering, Colorado State University, 2019 – 2021.
- Member of the Code Committee, Department of Civil and Environmental Engineering, Colorado State University, 2018 – 2020.
- Member of the Accreditation Committee, Department of Civil and Environmental Engineering, Colorado State University, 2018 – present. Committee Chair 2022-2023.
- Member of the Graduate Instruction Committee, Department of Civil and Environmental Engineering, Colorado State University, 2016 – 2021. Committee Chair 2020-2021.
- Member of the ad-hoc Scott Presidential Chair faculty search committee, Department of Civil and Environmental Engineering, Colorado State University, 2018
- Member of the Graduate Admissions Committee, Department of Civil and Environmental Engineering, Colorado State University, 2013 – 2018.
- Member of Environmental Engineering Faculty Search Committee, Department of Civil and Environmental Engineering, Colorado State University, 2016-17.

#### *College*

- Faculty member of the Engineering Student Technology Committee (ESTC), College of Engineering, Colorado State University, 2015 – 2017.

- Chair of the College of Engineering Technology Committee (CETC), College of Engineering, Colorado State University, 2015 – 2017.
- Internal reviewer for NSF CAREER proposals, CSU College of Engineering, 2016-2020.
- Panelist, NSF CAREER Educational Plan and Broader Impacts Panel, CSU College of Engineering, 2017-2018.

#### *University*

- Walter Scott, Jr. College of Engineering representative on the REDEFINE: Rstor Researcher Focus Group, 2020-present.
- Department of Civil and Environmental Engineering representative on the Faculty Council, Colorado State University, 2018 – 2021.
- CSU Water Center Grant Review Committee, 2017.

#### **Outreach**

- Organizer and instructor of the CSU Alliance River Science STEM Institute, a week-long summer program for high school students, June 2016, 2017, 2018, 2019.
- Flume demonstrations for CSU Engineering Exploration Days, every February and October 2015-2019.
- Instructor for two days of activities for the rivers, hydraulics, and fires portion of the CSU Native American STEM Institute program, June 2016 and 2017.
- Instructor for one day of river science and experiment activities for the Envision group, June 2016 and 2017.
- Developed and taught a week-long course in sediment transport for the Sindh Irrigation Department as part of the USAID US-Pakistan Center for Advanced Studies in Water (UPCAS-W), Mehran University of Engineering and Technology, Jamshoro Pakistan, December 2018.

#### **Funding**

##### *Externally-funded research*

- “Geomorphology and hydraulic impacts of post-fire in-stream treatments”, USDA Forest Service, PI, 8/2023-7/2026, \$182,063.
- “EAR-Climate: How snow modulates hydro-geomorphic change and recovery after fire”, National Science Foundation, co-PI, 7/2023-6/2026, \$727,928.
- “Experimental investigation of slope and precipitation intensity on post-fire mulching effectiveness”, Joint Fire Science Program, PI, 12/15/2022-12/14/2023, \$25,000.
- “Characterizing rain storm intensity, duration, and size across an elevation gradient for assessment of post-fire hazards”, Joint Fire Science Program, PI, 12/15/2022-12/14/2023, \$25,000.
- “Watershed-scale impacts of post-fire mulch on streamflow, erosion, vegetation, and water quality”, Northern Colorado Water Conservancy District, PI, 4/27/2022-3/29/2024, \$300,000.
- “Effects of post-fire mulch applications on long-term watershed recovery”, Colorado Water Center, co-PI, 7/1/2022-6/30/2023, \$50,000.
- “Experimental investigation of post-fire mulching impacts on runoff, erosion, and water quality,” USDA Agricultural Experiment Station, 7/1/2022-6/30/2025, \$90,000.
- “Multi-year evaluation of the hydrologic, geomorphic, and biogeochemical impacts of post-fire mulching,” City of Greeley, PI, 3/18/2022-8/27/2025, \$203,145.
- “Hydrologic, geomorphic, and biogeochemical impacts of post-fire mulching,” Coalition for the Poudre River Watershed, PI, 10/28/2021-6/30/2022, \$35,000.
- “RAPID: Wildfire impacts on snowpack, flow paths, and sediment dynamics across an elevation gradient”, National Science Foundation Hydrologic Sciences, Crosscutting Activities, and Geomorphology and Land-use Dynamics, Sr. Personnel, 11/1/2020-10/31/2021, \$49,990.
- “Incorporating Floodplain Functions into River Restoration Engineering: The Role of Floodplain Vegetation on Channel-Floodplain Hydrodynamics”, National Science Foundation Environmental Sustainability, co-PI, 8/1/2019-7/31/2023, \$309,553.



- “Probabilistic Modeling of Landslide Hazards to Improve the Resilience of Transportation Infrastructure”, Mountain Plains Consortium, PI, 3/20/2019 – 2/28/2021, \$56,000.
- “A systems modeling approach to quantify forest fuel treatment effects on wildfire severity and post-fire erosion,” CSU Water Center, co-PI, 7/1/2017-5/15/2018, \$25,000.
- “Phase 3: Sediment delivery to streams from roads and fires,” USDA Forest Service, co-PI, 10/1/2017-9/30/2018, \$29,920.
- “Investigation of the Effects of Whitewater Parks on Native Fishes in Colorado: A Comparison of 3D Smoothed Particle Hydrodynamics (SPH) and 2D Model Predictions”, CSU Water Center, co-PI, 7/1/2016-5/15/2017, \$25,000.
- “Evaluation of fish passage at white water parks using 2D modeling techniques”, Colorado Department of Parks and Wildlife, PI, 7/1/2016 – 10/31/2017, \$51,621.
- “Sediment delivery to streams from wildfires and unpaved roads”, USDA Forest Service, co-PI, 5/1/2015 – 9/30/2016, \$24,518.
- “CAREER: Experimental and Theoretical Investigation of Sediment Supply and Sorting in Meandering Rivers”, National Science Foundation, sole PI, 4/15/2015 – 3/31/2021, \$510,848.
- “Investigating the effects of sediment supply, width variation, and unsteady flow on riffle-pool dynamics”, National Science Foundation Geomorphology and Land-use Dynamics, sole PI, 9/1/2014-8/31/2018, \$279,000.
- “Modeling Stratigraphic Feedbacks in Fluvial Morphodynamics”, American Chemical Society Petroleum Research Fund New Doctoral Investigator program, sole PI, 9/1/2014-8/31/2016, \$100,000.
- “Effects of fires and floods on water, sediment and stream channels”, USDA Forest Service, co-PI, 8/26/2014 – 9/30/2015, \$24,500.
- “Wildfire impacts on peak flows and sediment delivery: implications for irrigation infrastructure and management”, USDA Agricultural Experiment Station, PI, 7/1/2014 – 6/30/2017, \$90,000.
- “RAPID: Characterizing the response of a burned landscape to an unusual and extreme rain event”, National Science Foundation Geomorphology and Land-use Dynamics, sole PI, 3/1/2014-2/28/2015, \$12,922.
- “Developing scholarly excellence across the aquatic-terrestrial interface: Understanding the hydro-bio-geo-chemistry of extreme events”, CSU Water Center, co-PI, 11/18/2013 – 5/15/2014, \$24,982.
- “Design hydrology for stream restoration and channel stability at stream crossings”, Transportation Research Board, 7/1/2013-1/31/2016, co-PI, \$350,000.
- “Spatial dynamics of burn severity and post-fire recovery in the High Park Fire burn area”, National Science Foundation Ecosystem Science and Sustainability, co-PI, 7/1/2013-6/30/2016, \$922,276.
- “Modeling the morphodynamics of meandering bedrock rivers”, National Science Foundation International Research Fellowship Program, sole PI, 1/1/2011 – 7/31/2012, \$109,000
- National Science Foundation Graduate Research Fellowship, sole PI, 9/1/2005 – 8/31/2009, \$126,000.

#### *Internal funding*

- RTK-GNSS system for research and teaching, Borland Equipment Fund, CSU Dept. of Civil and Environmental Engineering, 2023, \$9,781.
- Rainfall simulator for hydrologic and erosion research, Borland Equipment Fund, CSU Dept. of Civil and Environmental Engineering, 2022, \$14,655.
- Unifying CSU researchers investigating fire impacts on western ecosystems and water supply, CSU Office of the Vice President for Research, 2022, \$30,000.
- Miniature, High Sensitivity Pressure Transducers, and a Low-Discharge Flowmeter to Support Experiments at CSU's Hydraulics Laboratory, Borland Equipment Fund, CSU Dept. of Civil and Environmental Engineering, 2018, \$6,015.
- Proposal for a high-capacity data backup system, Borland Equipment Fund, CSU Dept. of Civil and Environmental Engineering, 2017, \$5,235.
- Proposal to purchase a laser-optic disdrometer, Borland Equipment Fund, CSU Dept. of Civil and Environmental Engineering, 2017, \$8,417.
- Proposal for a multi-functional 3D laser scanner, Borland Equipment Fund, CSU Dept. of Civil and Environmental Engineering, R. Morrison and P. Nelson, 2016, \$10,000,

- Proposal for a new high-capacity sediment sieving system, Borland Equipment Fund, CSU Dept. of Civil and Environmental Engineering, 2016, \$6,896.
- Purchase of a high-performance computer to support laboratory, field, and numerical modeling studies, Borland Equipment Fund, CSU Dept. of Civil and Environmental Engineering, 2015, \$8,975.
- Purchase of a boat-based bathymetry measurement system, Borland Equipment Fund, CSU Dept. of Civil and Environmental Engineering, 2014, \$6,600.
- Fabrication of adjustable flume tailgates, Borland Equipment Fund, CSU Dept. of Civil and Environmental Engineering, 2013, \$5,000.
- Development of a digital SLR grain size measurement and laser topography system, Borland Equipment Fund, CSU Dept. of Civil and Environmental Engineering, 2013, \$1,375.61.
- Fabrication of a gravel sediment feeder, Water Science and Engineering for Environmental Sustainability PRSE, CSU Dept. of Civil and Environmental Engineering, 2013, \$2,250.
- Purchase of a survey-grade GPS (Topcon GR-5), Borland Equipment Fund, CSU Dept. of Civil and Environmental Engineering, P. Nelson and B. Bledsoe, 2012, \$7,075.
- Purchase of a field Acoustic Doppler Velocimeter (ADV), Borland Equipment Fund, CSU Dept. of Civil and Environmental Engineering, P. Nelson, B. Bledsoe, and T. Gates, 2012, \$4,780.

### **Consulting**

- “North Platte Chokepoint Engineering Services”, Platte River Recovery Implementation Program, 6/2023-6/2024, \$400,000. Technical expert for sediment transport modeling to Anderson Consulting.

### **Teaching**

At Colorado State University

(\*includes online component)

- CIVE 521: Hydrometry (Fall 2012, Fall 2014, Spring 2016, Fall 2017, Fall 2019, Fall 2021, Fall 2023)
- CIVE 261: Dynamics (Spring 2013, Spring 2014\*)
- CIVE 202: Numerical Modeling and Risk Analysis (Fall 2013, Fall 2014, Fall 2015, Fall 2016, Fall 2017, Fall 2018, Fall 2019, Fall 2020\*, Fall 2021\*, Fall 2022\*, Fall 2023\*)
- CIVE 581A9: Morphodynamic Modeling (Spring 2015, Spring 2017)
- CIVE 513: Morphodynamic Modeling (Spring 2019, Fall 2020\*, Fall 2022\*)

At UC Berkeley (as a Graduate Student Instructor)

- EPS 117: Geomorphology (Fall 2008)
- EPS 217: Fluvial Geomorphology (Spring 2007)
- EPS 50: The Planet Earth (Spring 2006)

### **Graduate Students Advised**

- Mitch Delcau (Ph.D., 2023-present)
- Alex Thornton-Dunwoody (M.S., 2023 – present)
- Phoebe White (Ph.D., 2021 – present)
- Andy Brew (M.S., 2014)
- Dan Brogan (M.S., 2014)
- Tyler Rosburg (M.S., 2015)
- Andy Bankert (M.S., 2016)
- Tessa Hanson (M.S., 2016)
- Ryan Brown (M.S., 2017)
- Travis Hardee (M.S., 2017)
- Jacob Morgan (Ph.D., 2018)
- Robert Queen (M.S., 2018)
- Craig Baxter (M.S., 2018)
- Dan Brogan (Ph.D., 2018)

- Danny White (M.S., 2019)
- David Cortese (M.S., 2020)
- Zack Billingsley (M.S., 2021)
- Elizabeth Byron (M.S., 2021)
- Nick Brouillard (M.S., 2021; co-advisor)
- Ryan Baird (M.S., 2022)
- Brian Murphy (Ph.D., 2022)
- Mike Gieschen (M.S., 2022)
- Jongseok Cho (Ph.D., 2023)
- Lindsey Hayter (M.S., 2023)
- Johnny Murray (M.S., 2023)
- Danny White (Ph.D., 2023; co-advisor)

### **Graduate Student Committees**

- Casey Zoellick (CSU, Ph.D., 2022-present)
- David Scott (CSU, M.S., 2022-present)
- Omar Ghamedi (CSU, Ph.D., 2022-present)
- Megan Sears (CSU, Ph.D., 2022-present)
- Jonathan McIntosh (CSU, M.S., 2013)
- Michael Rafferty (CSU, M.S., 2013)
- Tim Stephens (CSU, M.S., 2014)
- Sam Michels-Boyce (CSU, M.S., 2014)
- Sarah Schmeer (CSU, M.S., 2014)
- Katherine Shervais (CSU, M.S., 2015)
- Scott Shahverdian (CSU, M.S., 2015)
- Erin Ryan (CSU, M.S., 2015)
- Joel Sholtes (CSU, Ph.D., 2015)
- Elizabeth Oswald (CSU, M.S., 2015)
- Angel Monsalve Sepúlveda (University of Idaho, Ph.D., 2016)
- Brad Sparks (CSU, M.S., 2016)
- Maisie Richards (CSU, M.S., 2016)
- Robert Tournay (CSU, Ph.D., 2016)
- Travis Stroth (CSU, M.S., 2016)
- Dylan Armstrong (CSU, M.S., 2017)
- Matt Sparacino (CSU, M.S., 2017)
- Scott Zey (CSU, M.S., 2017)
- Kaiwei Chen (CSU, M.S., 2017)
- Nathan Kelly (CSU, M.S., 2018)
- Johanna Eidmann (CSU, M.S., 2018)
- Dan Scott (CSU, Ph.D., 2018)
- Rod Lammers (CSU, Ph.D., 2018)
- Kristin Laforge (CSU, M.S., 2018)
- Florian Cordier (Université de Paris-Est, Ph.D., 2018)
- Tom Smrdel (CSU, M.S., 2019)
- Sujana Timilsina (CSU, M.S., 2019)
- Chun-yao Yang (CSU, Ph.D., 2019)
- Faith Groff (CSU, M.S., 2019)
- Sydney Doidge (CSU, M.S., 2019)
- Ali Reza Nowrooz Pour (CSU, Ph.D., 2020)
- Tori Beckwith (CSU, M.S., 2020)
- Jeremiah Piersante (CSU, M.S., 2020)
- Matthew Klema (CSU, Ph.D., 2021)
- Mattia Carlin (University of Trento, Ph.D., 2021)

- Kira Simonson (CSU, M.S., 2022)
- Quinn Miller (CSU, M.S., 2022)
- Ali Cole (CSU, M.S., 2022)
- Chenchen Ma (CSU, M.S., 2022)
- Nathan Kelly (CSU, Ph.D., 2022)
- Tristen Anderson (CSU, M.S., 2023)
- Ryan Wells (CSU, M.S., 2023)
- Will Creed (CSU, M.S., 2023)
- A. Kasun Prabodha Sahabandu (CSU, M.S., 2023)
- Jack Derbique (CSU, M.S., 2023)
- Jordyn Geller (CSU, M.S., 2023)

**Undergraduate Students Advised**

- Adrian Jimenez Ramos (CSU, Scott Undergraduate Research Experience (SURE) Fellowship, 2023)
- Aidan Cruz (CSU Extension Undergraduate Intern, 2022)
- Cameron Turnbow (CSU Extension Undergraduate Intern, 2022)
- Evan Malloy (CSU, Scott Undergraduate Research Experience (SURE) Fellowship, 2020-2021)
- Anna Wikowsky (CSU, Scott Undergraduate Research Experience (SURE) Fellowship, 2019-2021)
- Beau Van Der Sluys (CSU, Scott Undergraduate Research Experience (SURE) Fellowship, 2019-2020)
- Megan Bock (CSU, Scott Undergraduate Research Experience (SURE) Fellowship, 2019-2020)
- Aaron Schoelkopf (CSU, work-study student, 2017)