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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

- 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)

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 Wyzdga, 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 Wyzdga, 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 Wyzdga, 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

1. **Nelson, PA** and JA Morgan, Flow and sediment supply controls on gravel bedform dynamics, submitted to *Geomorphology*, in review.

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

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 Hought, 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 7th 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. 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)

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, 10th 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, 10th 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 8th 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, *4th 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 Wyzdga, 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 Wyzdga, **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 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

Affiliations

- American Geophysical Union, since 2004
- Geological Society of America, since 2004
- American Society of Civil Engineers, since 2012
- International Association of Hydraulic Researchers (IAHR), since 2016
- CSDMS (Community Surface Dynamics Modeling System) Terrestrial Working Group, since 2012
- Colorado Riparian Association, since 2013
- Rocky Mountain Hydraulic Research Center, since 2014

Honor Societies

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

Service

National/Professional

- Colorado Water Institute (CWI) representative on the Subcommittee on Sedimentation (SOS) of the Advisory Committee on Water Information (ACWI), 2013 – present.
 - Member of the Task Committee on Reservoir Sedimentation.
 - Member of the National Reservoir Sedimentation Team.
- Co-chair of session “Morphodynamics of mixed bedrock alluvial channels,” 2013 AGU Fall meeting.
- 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*.
- 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).

- Co-organizer of the annual Gilbert Club geomorphology meeting, 2004-2010
- Moderator of the Gilbert Club email listserv, 2009-2011

Department

- Member of the Accreditation Committee, Department of Civil and Environmental Engineering, Colorado State University, 2018 – present.
- Member of the Graduate Instruction Committee, Department of Civil and Environmental Engineering, Colorado State University, 2016 – present.
- 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
- Panelist, NSF CAREER Educational Plan and Broader Impacts Panel, CSU College of Engineering, 2017.

University

- Department representative on the Faculty Council, Colorado State University, 2018 – present.
- 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.
- Flume demonstrations for CSU Engineering Exploration Days, every February and October since 2015.
- 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.

Funding

Externally-funded research

- “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 – 4/14/2020, \$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

- 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.

Teaching

At Colorado State University
(*includes online component)

- CIVE 521: Hydrometry (Fall 2012, Fall 2014, Spring 2016, Fall 2017)
- 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)
- CIVE 581A9: Morphodynamic Modeling (Spring 2015, Spring 2017)

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

- Dan Brogan (Ph.D., 2014 - present)
- Jongseok Cho (Ph.D., 2013 - present)
- Brian Murphy (Ph.D., 2016 – present)
- Ryan Brown (Ph.D., 2017 – present)
- Mike Gieschen (M.S., 2014 - present)
- Craig Baxter (M.S., 2015 – present)
- Zack Billingsley (M.S., 2016 – 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)

Graduate Student Committees

- Sujana Timilsina (CSU, M.S., 2018 – present)
- Matthew Lurtz (CSU, Ph.D., 2017 – present)
- Matthew Klema (CSU, Ph.D., 2017 – present)
- Stephen Adams (CSU, Ph.D., 2016 – present)
- Ali Reza Nowrooz Pour (CSU, Ph.D., 2016 – present)
- Chun-yao Yang (CSU, Ph.D., 2016 – present)
- Tom Smrdel (CSU, M.S., 2014 – present)
- Jeremy Giovando (CSU, Ph.D., 2015 – 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)