**Dr Daniel David Buscombe**

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| Assistant Research Professor  School of Earth Sciences & Environmental Sustainability,  Northern Arizona University, Flagstaff,  Arizona 86011, USA | Tel: 9288908504  Email: daniel.buscombe@nau.edu  Web: www.danielbuscombe.com  Twitter: @GrainSize  Github: @dbuscombe-usgs  Speakerdeck: speakerdeck.com/dbuscombe |

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| **Education** | **University of Plymouth,** **UK**  Doctor of Philosophy in Coastal Geomorphology / Nearshore Oceanography  Thesis title: Morphodynamics, sediment dynamics and sedimentation of a gravel beach  Graduation date: September 2008  Advised by Prof. Gerhard Masselink and Dr Mark Davidson |
|  | **Lancaster University, Bowland College, UK**  Bachelor of Science (with Honours) Physical Geography, minors in Environmental Sciences and Biological Sciences  Thesis title: Morphodynamics of a Macrotidal Ridge-and-Runnel Beach  Graduation date: September 2003  Advised by Dr Suzana |
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| **Professional**  **Experience** | **Northern Arizona University, USA**  Assistant Research Professor, Sch. Earth Sciences & Environmental Sustainability  {Nov. 2016- present}  **United States Geological Survey, USA**  Research Geologist, Grand Canyon Monitoring & Research Center  {Nov. 2012- Nov. 2016}  **University of Plymouth, UK**  Postdoctoral Research Fellow, Sch. Marine Science & Engineering  {2009- 2012}  **University of California Santa Cruz, USA**  Postdoctoral Research Fellow, Dept. Earth & Planetary Sciences, and U.S. Geological Survey  {2008- 2009}  **University of Plymouth, UK**  Computer Programming Contractor, Marine Biology & Ecology Research Center  {2008- 2011}  Research Assistant, Sch. Marine Science & Engineering  {2007- 2008}  Associate Lecturer and PhD candidate, Sch. Geography  {2004- 2008}  **Field Studies Council, UK**  Assistant tutor, Castle Head Field Centre  {2003- 2004} |
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| **Publications** | 1. **Buscombe**, **D**., & Masselink, G. (2006) Concepts in Gravel Beach Dynamics. *Earth Science Reviews* 79, 33-52. 2. **Buscombe**, **D**., Austin, M.J. & Masselink, G. (2007) Field observations of step dynamics on a macrotidal gravel beach. In: Kraus, N. and Rosati, J. (Eds) *Proceedings of Coastal Sediments 2007* (Vol 1). 3. Austin, M.J., Masselink, G., Turner, I., **Buscombe, D.**, & Williams, J.J. (2008) Groundwater seepage between a gravel barrier and a freshwater lagoon. *Proceedings of the 31st International Conference on Coastal Engineering (ICCE)*, Hamburg. 4. Ruzi de Alegria, A., Masselink, G., Kingston, K., Williams, J.J., & **Buscombe, D.**(2008) Storm impacts on a gravel beach using the ARGUS video system. *Proceedings of the 31st International Conference on Coastal Engineering (ICCE)*, Hamburg. 5. **Buscombe**, **D**., Masselink, G., & Rubin, D.M. (2008) Granular properties from digital images of sediment: Implications for coastal sediment transport modelling. *Proceedings of the 31st International Conference on Coastal Engineering (ICCE)*, Hamburg. 6. Masselink, G. & **Buscombe**, **D**. (2008) Shifting gravel: A case study of Slapton Sands. *Geography Review* 22, 27-31. 7. **Buscombe**, **D**. (2008) Estimation of grain size distributions and associated parameters from digital images of sediment. *Sedimentary Geology* 210, 1-10. 8. Austin, M.J. & **Buscombe**, **D**. (2008) Morphological change and sediment dynamics of the beach step on a macrotidal gravel beach. *Marine Geology* 249, 167-183. 9. Masselink, G., **Buscombe**, **D**., Austin, M.J., O’Hare, T., & Russell, P. (2008) Sediment trend models fail to reproduce small scale sediment transport patterns on an intertidal beach. *Sedimentology* 55, 667-687. 10. Williams, J.J., Masselink, G., **Buscombe**, **D**., Turner, I., Matias, A., Ferreira, O., Meltje, N., Bradbury, A., Albers, T., & Pan, S. (2009) BARDEX (Barrier Dynamics Experiment): taking the beach into the laboratory. *Journal of Coastal Research* SI 56, 158 – 162. 11. Warrick, J.A., Rubin, D.M., Ruggiero, P., Harney, J., Draut, A.E., & **Buscombe**, **D**. (2009) Grain Size Information from the Statistical Properties of Digital Images of Sediment. *Earth Surface Processes & Landforms* 34, 1811-1821. 12. **Buscombe**, **D**., & Masselink, G. (2009) Grain Size Information from the Statistical Properties of Digital Images of Sediment. *Sedimentology* 56, 421-438. 13. **Buscombe**, **D**., Rubin, D.M. & Warrick, J.A. (2010) An automated and 'universal' method for measuring mean grain size from a digital image of sediment. *Proceedings of the 9th Federal Interagency Sedimentation Conference*, Las Vegas June 2010. 14. **Buscombe**, **D**., Rubin, D.M. & Warrick, J.A. (2010) Universal Approximation of Grain Size from Images of Non-Cohesive Sediment. *Journal of Geophysical Research - Earth Surface* 115, F02015. 15. Conley, D.C., **Buscombe**, **D**., & Nimmo-Smith, A. (2012) Use of digital holographic cameras to examine the measurement and understanding of sediment suspension in the nearshore. *Proceedings of the 33rd International Conference on Coastal Engineering*, Santander, July 2012. 16. **Buscombe**, **D**., & Conley, D.C. (2012) Schmidt number of sand suspensions under oscillating-grid turbulence. *Proceedings of the 33rd International Conference on Coastal Engineering*, Santander, July 2012. 17. Puleo, J.A., Conley, D.C., Masselink, G., Russell, P., Turner, I.L., Blenkinsopp, C., **Buscombe**, **D**., Lanckriet, T., McCall, R., and Poate, T. (2012). Comprehensive study of swash-zone hydrodynamics and sediment transport. *Proceedings of the 33rd International Conference on Coastal Engineering*, Santander, July 2012. 18. Lacy, J.R., Rubin, D.M. & **Buscombe**, **D**. (2012) Currents and sediment transport induced by a tsunami far from its source. *Journal of Geophysical Research - Oceans* 117, C09028. 19. **Buscombe**, **D**., & Rubin, D.M. (2012) Advances in the Simulation and Automated Measurement of Granular Material, Part 1: Simulations. *Journal of Geophysical Research - Earth Surface* 117, F02002. 20. **Buscombe**, **D**., & Rubin, D.M. (2012) Advances in the Simulation and Automated Measurement of Granular Material, Part 2: Direct Measures of Particle Properties. *Journal of Geophysical Research - Earth Surface* 117, F02002. 21. **Buscombe**, **D**., & Conley, D.C. (2012) Effective Shear Stress of Graded Sediment. *Water Resources Research* 48, W05506. 22. Williams, J.J., **Buscombe**, **D**., Masselink, G., Turner, I., & Swinkels, C. (2012) Barrier Dynamics Experiment (BARDEX): Aims, Design and Procedures. *Coastal Engineering* 63, 3 – 12. 23. **Buscombe**, **D**. (2013) Transferable Wavelet Method for Grain Size-Distribution from Images of Sediment Surfaces and Thin Sections, and Other Natural Granular Patterns. *Sedimentology* 60, 1709 – 1732. 24. **Buscombe**, **D**., Grams, P.E., & Kaplinski, M.A. (2014) Characterizing riverbed sediment using high-frequency acoustics 1: Spectral properties of scattering. *Journal of Geophysical Research - Earth Surface* 119, doi: 10.1002/2014JF003189. 25. **Buscombe**, **D**., Grams, P.E., & Kaplinski, M.A. (2014) Characterizing riverbed sediment using high-frequency acoustics 2: Scattering signatures of Colorado River bed sediment in Marble and Grand Canyons. *Journal of Geophysical Research - Earth Surface* 119, doi:10.1002/2014JF003191. 26. **Buscombe**, **D**., Rubin, D.M., Lacy, J.R., Storlazzi, C., Hatcher, G., Chezar, H., Wyland, R., & Sherwood, C. (2014) Autonomous bed-sediment imaging-systems for revealing temporal variability of grain size. *Limnology & Oceanography: Methods*, 32, 1241 – 1256. 27. Puleo, J., Blenkinsopp, C., Conley, D., Masselink, G., Turner, I., Russell, P.,A., **Buscombe**, **D**., Howe, D., Lanckriet, T., McCall, R., & Poate, T. (2014) Comprehensive Field Study of Swash-Zone Processes, Part 1: Experimental Design with Examples of Hydrodynamic and Sediment Transport Measurements, *Journal of Waterway, Port, Coastal & Ocean Engineering* 140, 29 - 42. 28. Tusso, R.B., **Buscombe**, **D**., & Grams. P.E. (2015) Using oblique digital photography for alluvial sandbar monitoring and low-cost change detection. *Proceedings of the 10th Federal Interagency Sedimentation Conference*, Reno, April 2015. 29. **Buscombe**, **D**., Grams. P.E., Melis, T.S., & Smith, S. (2015) Considerations for unsupervised riverbed sediment characterization using low-cost sidescan sonar: Examples from the Colorado River, AZ and the Penobscot River, ME. *Proceedings of the 10th Federal Interagency Sedimentation Conference*, Reno, April 2015. 30. **Buscombe**, **D**., Grams. P.E., Kaplinski, M.A., Tusso, R.B., & Rubin, D.M. (2015) Hydroacoustic signatures of Colorado riverbed sediments in Marble and Grand Canyons using multibeam sonar. *Proceedings of the 10th Federal Interagency Sedimentation Conference*, Reno, April 2015. 31. Grams, P.E., **Buscombe**, **D**., Topping, D.J., Hazel, J.E., & Kaplinski, M.A. (2015) Use of Flux and Morphologic Sediment Budgets for Sandbar Monitoring on the Colorado River in Marble Canyon, Arizona. *Proceedings of the 10th Federal Interagency Sedimentation Conference*, Reno, April 2015. 32. Davies, E.J., **Buscombe**, **D**., Graham, G.W., & Nimmo-Smith, W.A.M. (2015) Evaluating Unsupervised Methods to Size and Classify Suspended Particles using Digital in-line Holography. *Journal of Atmospheric & Oceanographic Technology* 32, 1241 – 1256. 33. **Buscombe**, **D**., Grams, P.E., & Smith, S.M. (2015) Automated riverbed sediment classification using low-cost sidescan sonar. *Journal of Hydraulic Engineering* 10.1061/(ASCE)HY.1943-7900.0001079, 06015019. 34. **Buscombe**, **D**. (2016) Spatially explicit spectral analysis of point clouds and geospatial data. *Computers & Geosciences* 86, 92-108. 35. **Buscombe**, **D**. & Grams, P.E. (2016) Stochasticity of riverbed backscattering, with implications for acoustical classification of non-cohesive sediment using multibeam sonar. *Proceedings of the 8th International Conference on Fluvial Hydraulics*, St. Louis, Missouri, July 2016. 36. Hamill, D., **Buscombe**, **D**., Wheaton, J.M., Melis, T.S., & Grams. P.E. (2016) Towards bed texture change detection in large rivers from repeat imaging using recreational grade sidescan sonar. *Proceedings of the 8th International Conference on Fluvial Hydraulics*, St. Louis, Missouri, July 2016. 37. Cuttler, M., Lowe, R., Falter, J., & **Buscombe**, **D**. (2016) Estimating the settling velocity of bioclastic sediment from common grain-size analysis techniques. *Sedimentology* 10.1111/sed.12338. 38. **Buscombe**, **D**. (2017) Shallow water benthic imaging and substrate characterization using recreational-grade sidescan-sonar. *Environmental Modelling & Software* 89:1-18. 39. Kaplinski, M.A., Hazel, J.E., Grams. P.E., Kohl, K., **Buscombe**, **D**., & Tusso, R.B. (2017) Channel mapping river miles 29–62 of the Colorado River in Grand Canyon National Park, Arizona, May 2009. *U.S. Geological Survey Open-File Report 2017–1030*, 35 p., <https://doi.org/10.3133/ofr20171030>. 40. **Buscombe**, **D**., Grams, P.E., & Kaplinski, M.A. (in review) Compositional signatures in acoustic backscatter over vegetated and unvegetated mixed sand-gravel riverbeds. *Journal of Geophysical Research - Earth Surface* 41. **Buscombe**, **D**., Conley, D.C, & Nimmo-Smith, W.A.M. (in prep) Effect of bubbles on acoustic measurements of suspended sand in the surf zone. *Continental Shelf Research* 42. Grams. P.E., **Buscombe**, **D**., Topping, D.J. Hazel, J.E., Kaplinski, M.A. (in prep) Constructing a closed sediment budget in a noisy river. *Earth Surface Processes & Landforms* |
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| **Conference Presentations** | {2017}  Grams, P.E., **Buscombe, D.**, Topping, D.J., and Mueller, E.R. (2017) Sand Pulses and Sand Patches on the Colorado River in Grand Canyon. *River, Coastal and Estuarine Morphodynamics*, Padova, Italy, September 2017.  **Buscombe, D.**, Kaplinksi, M., Grams, P.E., Ashley, T., McElroy, B., and Rubin, D.M. (2017) The sand dunes of the Colorado River, Grand Canyon, USA. *River, Coastal and Estuarine Morphodynamics*, Padova, Italy, September 2017.  {2016}  Hamill, D., **Buscombe, D.**, Wheaton, J., and Wilcock, P. (2016) Recreational-Grade Sidescan Sonar: Transforming a Low-Cost Leisure Gadget into a High Resolution Riverbed Remote Sensing Tool. *American Geophysical Union Fall Meeting*, San Francisco, Dec 2016.  Grams, P.E., Schmeeckle, M., Mueller, E., **Buscombe, D.**, Kasprak, A., and Leary, K. (2016) Experimental Demonstration of 3-Dimensional Flow Structures and Depositional Features in a Lateral Recirculation Zone. *American Geophysical Union Fall Meeting*, San Francisco, Dec 2016.  Kasprak, A., **Buscombe, D.**, Caster, J., Grams, P.E., and Sankey, J.B. (2016) The individual and additive effects of vegetation encroachment and hydrologic alteration on sediment connectivity in Grand Canyon. *American Geophysical Union Fall Meeting*, San Francisco, Dec 2016.  Rossi, R., **Buscombe, D.**, Grams, P.E., Wheaton, J.M., and Schmidt, J. (2016) From Hype to an Operational Tool: Efforts to Establish a Long-Term Monitoring Protocol of Alluvial Sandbars using `Structure-from-Motion' Photogrammetry. *American Geophysical Union Fall Meeting*, San Francisco, Dec 2016.  Ashley, T., McElroy, B., **Buscombe, D.**, Grams. P.E., Kaplinski, M.A., (2016) Estimating bedload from gage data to improve flux-based sediment budgets. *Geological Society of America Meeting*, Denver, Sept 2016.  **Buscombe, D.**, and Grams. P.E. (2016) Stochasticity of riverbed backscattering, with implications for acoustical classification of non-cohesive sediment using multibeam sonar. *8th International Conference on Fluvial Hydraulics*, St. Louis, MO.  Hamill, D., **Buscombe, D.**, Wheaton, J., and Wilcock, P. (2016) Recreational-Grade Sidescan Sonar: Transforming a Low-Cost Leisure Gadget into a High Resolution Riverbed Remote Sensing Tool. *8th International Conference on Fluvial Hydraulics*, St. Louis, MO.  {2015}  Grams. P.E., **Buscombe, D.**, Hazel, J.E., Kaplinski, M.A., Topping, D.J. (2015) Patterns of Channel and Sandbar Morphologic Response to Sediment Evacuation on the Colorado River in Marble Canyon, Arizona. *American Geophysical Union Fall Meeting*, San Francisco, Dec 2015.  Ashley, T., McElroy, B., **Buscombe, D.**, Grams. P.E., Kaplinski, M.A., (2015) Examining the relationship between suspended sand load and bedload on the Colorado River, using concurrent measurements of suspended sand and observations of sand dune migration. *American Geophysical Union Fall Meeting*, San Francisco, Dec 2015.  Rubin, D.M., Topping, D.J., Schmidt, J.C., Grams. P.E., **Buscombe, D.**, East, A.E., Wright, S.A., (2015) Interpreting hydraulic conditions from morphology, sedimentology, and grain size of sand bars in the Colorado River in Grand Canyon. *American Geophysical Union Fall Meeting*, San Francisco, Dec 2015.    Kaplinski, M.A., **Buscombe, D.**, Ashley, T., Tusso, R.B., Grams. P.E., McElroy, B., Mueller, E., Hamill, D., and Townsend, J. (2015) Observations of sand dune migration on the Colorado River in Grand Canyon using high-resolution multibeam bathymetry. *American Geophysical Union Fall Meeting*, San Francisco, Dec 2015.  Hensleigh, J., **Buscombe, D.**, Wheaton, J.M., and Brasington, J. (2015) TopCAT and PySESA: Open-source software tools for point cloud decimation, roughness analyses, and quantitative description of terrestrial surfaces. *American Geophysical Union Fall Meeting*, San Francisco, Dec 2015.    **Buscombe, D.**, Wheaton, J.M., Hensleigh, J., Grams, P.E., Welcker, C., Anderson, K., and Kaplinski, M. (2015) Addressing scale dependence in roughness and morphometric statistics derived from point cloud data. *American Geophysical Union Fall Meeting*, San Francisco, Dec 2015.    **Buscombe, D.** (2015) Acoustic and topographic sediment classification in Lower Marble Canyon. 2nd MBES in Rivers Workshop, USGS Flagstaff, AZ, March 2015.    **Buscombe, D.** and Kaplinski, M.A. (2015) Characterizing sand dune migration on the Colorado River in Western Grand Canyon using repeat multibeam mapping. *2nd MBES in Rivers Workshop*, USGS Flagstaff, AZ, March 2015.  **Buscombe, D.** (2015) Towards automated substrate mapping with low-cost sidescan sonar. *2nd MBES in Rivers Workshop*, USGS Flagstaff, AZ, March 2015.  {2014}  Rubin, D., Topping, D., Grams, P., Tusso, R., Schmidt, J., **Buscombe, D.**, Melis, T., Wright, S. (2014) What sediment grain size reveals about suspended-sediment transport in the Colorado River in Grand Canyon. *International Conference on the Status and Future of the World's Large Rivers*  **Buscombe, D.**, Grams. P.E., and Kaplinski, M.A. (2014) Bed sediment classification using acoustic backscatter *1st MBES in Rivers Workshop*, Utah State University, Feb 2014.  **Buscombe, D.**, Grams. P.E. (2014) Topographic and acoustic estimates of grain-scale roughness from high-resolution multibeam echo-sounder: examples from the Colorado River in Marble and Grand Canyons. *American Geophysical Union Fall Meeting*, San Francisco, Dec 2014.  {2013}  Kaplinski, M.A., Hazel, J.E., Grams. P.E., **Buscombe, D.**, Hadley, D., and Kohl. K. (2013) Constructing a morphologic sediment budget, with uncertainties, for a 50-km segment of the Colorado River in Grand Canyon. *American Geophysical Union Fall Meeting*, San Francisco, Dec 2013  Grams. P.E., **Buscombe, D.**, Hazel, J.E., Kaplinski, M.A., and Topping, D.J. (2013) Reconciliation of Flux-based and Morphologic-based Sediment Budgets. *American Geophysical Union Fall Meeting*, San Francisco, Dec 2013  **Buscombe, D.**, Grams. P.E., Kaplinski, M.A. (2013) Acoustic Scattering by an Heterogeneous River Bed: Relationship to Bathymetry and Implications for Sediment Classification using Multibeam Echosounder Data. *American Geophysical Union Fall Meeting*, San Francisco, Dec 2013  Davies, E.J., **Buscombe, D.**, Graham, G., Nimmo Smith, W.A.M. (2013) Evaluating Unsupervised Methods to Size and Classify Suspended Particles Using Digital Holography. *American Geophysical Union Fall Meeting*, San Francisco, Dec 2013  {2012}  Conley, D.C., **Buscombe, D.**, and Nimmo-Smith, A. (2012) New understandings of sediment suspension in the nearshore from cross-comparisons of diverse sensors. *Ocean Sciences 2012*, Salt Lake City  **Buscombe, D.**, Conley, D.C., and Rubin, D.M. (2012) Co-variation of intertidal morphology, bedforms and grain size on a macrotidal sand beach: Praa Sands, UK. *Ocean Sciences 2012*, Salt Lake City  Nimmo-Smith, A., **Buscombe, D.**, and Conley, D.C. (2012) Use of digital holographic cameras to examine the measurement and understanding of sediment suspension in the nearshore. *Particles in Europe*, Barcelona, October 2012  {2011}  **Buscombe, D.**, and Conley, D.C. (2011) Formula for Motion Threshold per Grain Size for Graded Sediments in Steady Flows. *European Geosciences Union General Assembly 2011*, Vienna  **Buscombe, D.**, and Rubin, D.M. (2011) How do you tell how big something is without direct measurement? Estimating grain size using an image’s spectrum. *American Geophysical Union Fall Meeting*, San Francisco, Dec 2011  {2010}  **Buscombe, D.** Lacy, J.R., and Rubin, D.M. (2010) Fractional resuspension and sediment flux on a wave-dominated, non-cohesive, inner continental shelf. *Ocean Sciences 2010*, Portland  Rubin, D.M., **Buscombe, D.**, Lacy, J.R., Chezar, H., Hatcher, G., and Wyland, R. (2010) Seafloor sediment observatory on a cable and a shoestring. *Ocean Sciences 2010*, Portland  **Buscombe, D.**, and Conley, D.C. (2010) Modeling sand resuspension and stratification in turbulent nearshore flows: sensitivity to grain size distribution. *Ocean Sciences 2010*, Portland  Lacy, J.R., **Buscombe, D.**, and Rubin, D.M. (2010) Tsunami-enhanced sediment resuspension on the inner shelf in northern Monterey Bay, California. *Ocean Sciences 2010*, Portland  Conley, D.C., and **Buscombe, D.** (2010) Effects of Grain Size Distributions on Fluid-Sediment Feedback. *European Geosciences Union General Assembly 2010*, Vienna  Rubin, D.M., Chezar, H., **Buscombe, D.,** Warrick, J.A., Barnard, P.L., Lacy, J.R., Hatcher, G., Wyland, R., Storlazzi, C., Conaway, C.H., Topping, D.J., Melis, T.S., and Grams, P.E. (2010) New technology for in-situ grain-size analysis from digital images of sediment, and resulting insights regarding sediment transport. *9th Federal Interagency Sedimentation Conference*, Las Vegas June 2010.  **Buscombe, D.,** Rubin, D.M., and Lacy, J.R. (2010) Hourly Measurements of Grain-Size from the Inner Continental Shelf Seabed Using a Fully-Automated, Hydraulically-Controlled Underwater Video Microscope. *Particles in Europe 2010*, Villefranche-Sur-Mer, France.  Williams, J.J., Masselink, G., **Buscombe, D.**, and 10 others (2010) BARDEX (Barrier Dynamics Experiments): a laboratory study of gravel barrier response to waves and tides. *Hydralab III Joint User Meeting*, Hannover  {2009}  Williams, J.J., Masselink, G., **Buscombe, D.**, and 7 others (2009). BARDEX (Barrier Dynamics Experiment): taking the beach into the laboratory. *10th International Coastal Symposium (ICS),* Lisbon, Portugal 2009  {2008}  **Buscombe, D.**, Ruiz de Alegria, A., and Masselink, G. (2008). The relative importance of cross- and along-shore sediment transport in planform and profile adjustments of a gravel barrier beach: Slapton, Devon, UK. *American Geophysical Union Fall Meeting*, San Francisco, Dec 2008  {2007}  **Buscombe, D.**, and Masselink, G. (2007) The relationship between sediment properties and sedimentation patterns on a macrotidal gravel beach over a semi lunar tidal cycle. *American Geophysical Union Fall Meeting*, San Francisco, Dec 2007 |
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| **Teaching** | EES 680, Spring 2017. *Earth & Environmental Data Analysis*  Course leader – University of Northern Arizona  EES 698-1, Fall 2015. *Topics in Fluvial Geomorphology*  Guest lecturer – University of Northern Arizona  EES 529, Fall 2014–2016. *Applied Remote Sensing*  Guest lecturer – University of Northern Arizona  OS204, 2010 – 2012. *Waves, Tides and Coastal Dynamics*  Guest lecturer – University of Plymouth  OS311 2010 – 2012, *Modelling Ocean Processes*  Guest lecturer – University of Plymouth  Geography, 2004–2008. *Introductory statistics, Glacial Geomorphology, Coastal Geomorphology*  Teaching assistant – University of Plymouth  FSC, 2003 – 2004  Field- and classroom-based ecology, geology, environmental sciences  Teaching assistant – Field Studies Council Castle Head |
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| **Graduate Student**  **Mentoring** | **Andrew Platt.** *Estimates of total in-channel sand storage in Grand Canyon*. MS, Northern Arizona University, 2016-Present. School of Earth Sciences & Environmental Sustainability. Co-supervised with Dr Ryan Porter.  **Ryan Lima.** *Remote sensing of sandbar dynamics*. PhD, Northern Arizona University, 2016-Present. School of Earth Sciences & Environmental Sustainability. Co-supervised with Dr Temuulen Sankey.  **Rebecca Rossi**. *Structure-from-Motion surveying of sandbars in Grand Canyon*. MS, Utah State University, Department of Watershed Sciences, 2014-Present. Co-supervised with Dr Joseph Wheaton.  **Thomas Ashley**. *Sediment transport and the evolution of dune topography at the grain scale*. PhD, 2014-Present. School of Geology and Geophysics, University of Wyoming. Co-supervised with Dr Brandon McElroy.  **Daniel Hamill**. *Transforming a Low-Cost Leisure Gadget into a High Resolution Riverbed Remote Sensing Tool*. MS, Utah State University Department of Watershed Sciences, 2015-2017. Co-supervised with Dr Joseph Wheaton.  **Martin Meoli**. *Gravel transport under waves*. MSc Applied Marine Science, School of Marine Science & Engineering, University of Plymouth, 2011–2012. Co-supervised with Dr Alex Nimmo-Smith.  **James Sawyer**. *Holographic imaging of near-bed sand suspensions*. MSc Applied Marine Science, School of Marine Science & Engineering, University of Plymouth, 2011–2012. Co-supervised with Dr Daniel Conley |
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| **Awards**  **and Honors** | **ASCE-EWRI Best Technical Note Award**  Awarded by the Environmental & Water Resources Institute, American Society of Civil Engineers, February 2017. For Buscombe et al. (2016) Automated riverbed sediment classification using low-cost sidescan sonar, Journal of Hydraulic Engineering.  **U.S Geological Survey "What’s the Big Idea?"**  Research featured in the video “What’s the Big Idea? —Using Sound to Remotely Sense the Riverbed” on the YouTube channel of the U.S. Geological Survey, March 2016  **American Geophysical Research Union** **Research Spotlight**  Research featured in the article “Using Sound Waves to Study Grand Canyon Sediment”, EOS Earth and Space Science News, July 2015. https://eos.org/research-spotlights/using-sound-waves-to-study-grand-canyon-sediment  **Elsevier** **"Excellence in Peer Review" Award**  for the Elsevier journal, Sedimentary Geology, 2013  **Journal of Geophysical Research-Oceans Editor’s Highlight**  Research featured in the article “Novel observations of currents and drag generated by a tsunami” published in the Journal of Geophysical Research – Oceans. September 2012 |
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| **Service** | **Journal Reviewer, 2007 – present**  Arctic; Continental Shelf Research; Earth Surface Processes & Landforms; Geo-Marine Letters; Geophysical Research Letters; Journal of Hydraulic Engineering; Journal of Marine Science & Engineering; Journal of Mountain Science; Journal of Sedimentary Research; Marine Geology; Sedimentology; Sedimentary Geology; Water Resources Research.  **NEON Aquatic Technical Working Group, 2017 - present**  Member of the NSF-funded National Ecological Observatory Network Aquatic Technical Working Group, advising on bathymetry, substrate characterization, and hydroacoustic instrumentation and analyses. |
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| **Workshops and Conferences Organized** | {2016}  **Software Carpentry.** Lead organizer for this 3 day-long, 30-person workshop at U.S. Geological Survey.  {2015}  **MBES in Rivers**. Lead organizer for 2nd Multibeam in Rivers Workshop, a 3 day-long, 30-person workshop at U.S. Geological Survey.  {2013}  **AGU**. Co-convener of the session, EP010. Fluvial sediment budgets: Can we do better? American Geophysical Union Fall Meeting, December 2013  {2007}  **AGU.** Co-convener of the session, H60: Linking sediment supply, bed-sediment particle size, sediment transport, and bed morphology in fluvial, marine, and aeolian settings. American Geophysical Union Fall Meeting, December 2007  **YCSEC 2007**. On the organizing committee for the Young Coastal Scientist and Engineers Conference, 2007, hosted by the School of Geography at the University of Plymouth 19-21 April 2007.  {2005}  **QRA.** On the organizing committee for the Quaternary Research Association’s 4th International Postgraduate Symposium, hosted by the School of Geography at the University of Plymouth 31st August - 2nd September 2005. |
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| **Invited Talks** | {2017}  *Particle Size ‘by Proxy’: Decoding the Textural Information in Scattered Sound & Light*. Utah Water Research Laboratory, Utah State University, Logan, UT.  {2016}  *Large-scale SfM: Grand Canyon Style*. Pacific Coastal & Marine Science Center, USGS, Santa Cruz, CA.  *Particle Size ‘by Proxy’: Decoding the Textural Information in Remotely Sensed Landforms*. School of Earth Sciences & Environmental Sustainability, Northern Arizona University, Flagstaff, AZ.  *The Digital Grain Size Web Computing Application*. USGS Center for Data Integration, Denver, CO  *Observations of sand dune migration on the Colorado River in Grand Canyon*. Glen Canyon Dam Adaptive Management Program Adaptive Management Work Group Meeting, Phoenix, AZ  {2015}  *The Digital Grain Size Project: Past, Present and Future*. USGS Coastal and Marine Geology, Woods Hole, MA  {2014}  *Measuring bed sediments for improved sediment budgets and physical habitat assessment.* Glen Canyon Dam Adaptive Management Program Adaptive Management Work Group Meeting, Flagstaff, AZ  *Bed Sediment Classification Using High-Frequency Acoustic Backscatter.* Multibeam in Rivers Summit, Utah State University, Logan, UT  {2012}  *Digital Grain Size*. British Geological Survey, Marine Geosciences Division, Edinburgh, UK  *Nearshore Sediment Transport Through the Looking Glass*. Grand Canyon Monitoring and Research Center, Flagstaff, AZ  {2010}  *Turbulence, Sediment Stratification and Altered Resuspension under Waves*. Centre for Coastal Science and Engineering, University of Plymouth, UK  {2009}  *Morphodynamics and sediment dynamics of a macrotidal gravel beach*. Coastal and Marine Geology, United States Geological Survey, Santa Cruz, CA  {2008}  *Optical sensing of gravel sediment transport and characteristics: recent advances and future challenges.* Lancaster University Environmental Imaging Network, Lancaster University, UK  {2007}  *A year in the life of Slapton Sands - but was it a typical year?* Slapton Research Seminar, Field Studies Council, Slapton Ley, UK  {2006}  *Field observations of morphological change and sediment dynamics from the nearshore of a gravel beach*. Centre for Coastal Dynamics and Engineering (C-CoDE), University of Plymouth  *A view from the beach*. Slapton Research Seminar, Field Studies Council, Slapton Ley, UK  {2004}  *A tale of two storms*. Slapton Research Seminar, Field Studies Council, Slapton Ley, UK |
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| **Grants awarded** | {2017}  **USGS Coastal and Marine Geology Program. $350,000**  Co-Investigator (multiple PIs, J. Warrick and others), (2017 - 2018) *Remote Sensing Coastal Change*.  **National Park Service**. **$450,000**  Co-Investigator (multiple PIs, P.E. Grams and others), (2017 - 2020) Geomorphology and Sediment Transport on the Green and Colorado Rivers in Canyonlands National Park.  {2015}  **USGS Mendenhall post-doctoral fellowship. $200,000**  Co-investigator: T. Sankey (PI), P. Grams, A. East, D. Buscombe., T. Sankey, (2015 – 2017). The fluvial-aeolian- hillslope continuum: measurement and modeling of topography and vegetation to inform landscape-scale connectivity for sediment in river valley ecosystems  **USGS Center for Data Integration. $46,417**  Principal-Investigator (2015 - 2016). The digital grain size web and mobile computing application  **USGS Innovation Fund. $48,994**  Principal-Investigator (2015 - 2016). LOBOS (Limnological and Oceanographic Benthic Observation System): The next generation dual-scale submersible benthic imaging system. Jointly funded by the USGS Innovation Fund ($16,497), the Innovation Center for Earth Science Director's Fund ($17,497) and the USGS Southwest Biological Science Center ($15,000)  **Glen Canyon Dam Adaptive Management Work Group. $4,253,400**  Co-Investigator (multiple PIs – J. Schmidt and others), (2015 - 2017). Sandbars and sediment storage dynamics: long-term monitoring and research at the site, research and ecosystem scales. Grand Canyon Monitoring and Research Center Triennial Work Plan  {2014}  **National Park Service. $232,016**  Co-Investigator (multiple PIs – P.E. Grams and others), (2014 - 2017). Geomorphic Processes and Relations Among Flow Regime, Sediment Flux and Resource Conditions on the Green River in Canyonlands National Park  {2013}  **Glen Canyon Dam Adaptive Management Work Group. $2,911,400**  Co-Investigator (multiple PIs – J. Schmidt and others), (2013 - 2014). Sandbars and sediment storage dynamics: long-term monitoring and research at the site, research and ecosystem scales. Grand Canyon Monitoring and Research Center Biennial Work Plan  {2012}  **Engineering and Physical Sciences Research Council, UK. 240,000 GBP**  Co-Investigator; G. Masselink (PI), D.C. Conley, D. Buscombe., (2012 - 2014). Proto-type Experiment and Numerical Modelling of Energetic Sediment Transport under Waves (PESTS). EPSRC EP/K000306/1.  {2008}  **Plymouth Marine Science Education Fund.**  Principal-Investigator (2008). Travel grant to attend and present at ICCE Hamburg 2008  **Challenger Society for Marine Science**  Principal-Investigator (2008). Travel grant to attend and present at ICCE Hamburg 2008  **Society for Sedimentary Geology Grant**  Principal-Investigator (2008). President's Fund to investigate nearshore bedload transport and bedforms with stereo underwater video cameras  **International Association for Mathematical Geology**  Principal-Investigator (2008). Grant to develop and trial algorithms for quantification of granular properties and coarse-grain sediment transport from images of the sea bed  **International Association of Sedimentologists**  Principal-Investigator (2008). Grant to investigate nearshore bedload transport and bedforms with stereo underwater video cameras  {2007}  **American Geophysical Union**  Principal-Investigator (2007). Travel Grant, to attend the AGU 2007 Fall Meeting in San Francisco, CA  **British Geomorphological Society**  Principal-Investigator (2007). Postgraduate award, to attend and present at Coastal Sediments 2007, in New Orleans, LA |
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| **Software** | **DGS**  Software for automated analyses of grain size from images of sediment. Source code currently available in Matlab and Python.  **PyHum**  Software for reading, processing and analysis of Humminbird sidescan data. Source code available in Python/Cython.  **pysesa**  Python program for spatially explicit spectral analysis. Software for spatially explicit analysis of point clouds and spatially distributed data. Source code available in Python.  **Sand simulation toolbox**  Software for generating 3D discrete particle models consisting of realistic particles (with a size- and shape-distribution) with user-defined properties. Source code available in Matlab.  **MATSCAT**  Software for analysis of multiple-frequency acoustic backscatter for suspended sediment concentration and particle size. Source code available in Matlab.  **Benthic Analysis Tool**  Software for the semi-automation of species identification and measurement in deep-sea ROV/drop frame images. Source code available in Matlab. |
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| **Skills** | Experienced open source developer, with a specialization in scientific computing, including visualization, geospatial statistics, signal processing, image processing and machine learning.  Expert in the Python Language and extensions such as Cython; expert in the MATLAB language, experience writing R, C, C++, and Fortran code.  Experience with a variety of tools and languages, including bash, csh, L A TEX, HTML, Git, Linux, virtual machines, virtual environments, auto-deployment of software packages (PyPI, SWIG, Distutils, conda), distributed, parallel, out-of-core and cloud computing.  Experience with Hydrodynamic modelling software, including the General Ocean Turbulence Model; Simulating Waves Nearshore (SWAN); Simulating Waves ’til Shore (SWASH).  Experience with Hydrographic surveying and mapping software, including Generic Mapping Tools, MB-System and HYPACK, GIS, and geospatial libaries such as GDAL, and Proj-4. |
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| **References** | Available on request |