

## Dr Greg Sambrook Smith PhD

Senior Lecturer

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### About

Over the last 20 years Dr Sambrook Smith has been investigating the linkages between river processes and sedimentology at scales ranging from individual pores within a river bed up to km-long bars in some of the Worlds largest rivers. Research aims to generate new, generic and quantitative understanding of how rivers function across these scales. This is facilitated by development of new techniques such as endoscopic particle imaging velocimetry for use in porous media or application of geophysical techniques developed for marine settings into fluvial contexts . He has been awarded ~£900,000 as either PI or CI on recent/current research council grants to undertake this work.

### Qualifications

BSc (University of Leeds)

PhD (University of Sheffield)

### Biography

Dr Sambrook Smith was awarded his BSc in Geography from the University of Leeds in 1991 and completed his PhD at the University of Sheffield in 1994 under the supervision of Rob Ferguson. He was appointed as a Lecturer in Physical Geography at the University of Leeds for the academic year 1994/95. He then spent six years as a Lecturer in the School of Earth Sciences at Liverpool John Moores University before joining the University of Birmingham in 2001.

### Teaching

Modules taught;

Level 1: Global Environmental Issues

Level 2: Geomorphological Processes

Level 3: River Processes and Deposits

Masters: Fluvial Geomorphology

### Postgraduate supervision

- **Natalie Parker** (<http://www.gees.bham.ac.uk/staff/pgnop661.shtml>) (PhD); Are extreme events important? Sedimentological and geomorphological response to floods (with Stuart Lane, Durham)
- Adam Hitchman (PhD); Nanoparticle and trace element fate and behaviour in the surface-subsurface environment: impacts of chemistry, flow and bed structure (with Jamie Lead and Mark Sterling).
- **Tomasz Zuk** (<http://www.gees.bham.ac.uk/staff/pgtxz692.shtml>) (MPhil); Characteristics of meandering river deposits revealed using ground penetrating radar and resistivity surveys

Potential students should **[e-mail Dr Sambrook Smith directly \(mailto:g.smith.4@bham.ac.uk\)](mailto:g.smith.4@bham.ac.uk)** .

### Research

Sedimentology of braided rivers **[South Saskatchewan project \(http://www.gees.bham.ac.uk/staff/researchpages/saskatchewanriver.shtml\)](http://www.gees.bham.ac.uk/staff/researchpages/saskatchewanriver.shtml)**

**[Processes and deposits of the Worlds biggest rivers \(http://www.brighton.ac.uk/parana/\)](http://www.brighton.ac.uk/parana/)**

Interactions between permeable beds and open channel flows **[Near-Bed Fluid Dynamics \(http://www.gees.bham.ac.uk/research/projects/riverbeddynamics/index.shtml\)](http://www.gees.bham.ac.uk/research/projects/riverbeddynamics/index.shtml)**

Development of novel experimental and geophysical methods

**[Morphodynamics and sedimentology of the tidally-influenced fluvial zone \(http://www.brighton.ac.uk/columbia/\)](http://www.brighton.ac.uk/columbia/)**

Channel-floodplain interactions and basin-scale alluvial architecture

### Other activities

## Current research grants:

NERC, £692560, 2013-2016

The hydrodynamics of microbial landscapes

NERC, £778225, 2012-2015

The sedimentology of fluvial megascours

NERC, ~£35,000, 2011-2012

The sedimentary dynamics of fine-grained rivers: a novel application of marine geophysics to develop new fluvial facies models

NERC, ~£606905, 2010-2013

Morphodynamics and sedimentology of the tidally-influenced fluvial zone (TIFZ). With Phil Ashworth (Brighton), Andrew Nicholas (Exeter), Dan Parsons (Leeds) and Jim Best (Illinois).

NERC, ~£529347, 2010-2013

Do floods matter? Bridging the gap between fluvial morphodynamics & alluvial architecture. With Andrew Nicholas, Rolf Aalto and Luiz Aragão (all Exeter)

NERC, ~£602676, 2008-2011

*Dynamics and deposits of braid-bars in the World's largest rivers: processes, morphology & subsurface sedimentology.* With Phil Ashworth (Brighton), Richard Hardy (Durham), Stuart Lane (Durham), Andrew Nicholas (Exeter), Dan Parsons (Leeds) and Jim Best (Illinois).

NERC, ~£373000, 2007-2011

**Fluid dynamics across the interface in gravel-bed rivers: quantification and numerical modelling of flow in the hyporheic zone.** (<http://www.gees.bham.ac.uk/research/projects/riverbeddynamics/index.shtml>) With Jamie Lead, Richard Hardy (Durham) and Jim Best (Illinois)

## Publications

Reesink, A.J.H., Ashworth, P.J., **Sambrook Smith, G.H.** et al. (2013) Scales and causes of heterogeneity in bars in a large multi-channel river: Río Paraná, Argentina. *Sedimentology*. DOI: 10.1111/sed.12092

Nicholas, A.P., Ashworth, P.J., **Sambrook Smith, G.H.** and Sandbach, S.D. (2013) Numerical simulation of bar and island morphodynamics in anabranching mega-rivers. *Journal of Geophysical Research*. DOI: 10.1002/jgrf.20132

**Sambrook Smith, G.H.**, Best, J.L., Orfeo, O., Vardy, M.E. and Zinger, J.A. (2013) Decimeter-scale in situ mapping of modern cross-bedded dune deposits using parametric echo sounding: A new method for linking river processes and their deposits. *Geophysical Research Letters*, doi:10.1002/grl.50703.

Blois, G., Best, J.L., Christensen, K.T., Hardy, R.J. and **Sambrook Smith, G.H.** (2013). Coherent flow structures in the pore spaces of permeable beds underlying a unidirectional turbulent boundary layer: A review and some new experimental results. In: *Coherent Flow Structures at Earth's Surface* (Ed. by J.G. Venditti, J.L. Best, M. Church and R.J. Hardy), Wiley, Chichester, 43-62.

Lunt, I. A., **Sambrook Smith, G. H.**, Best, J. L., Ashworth, P.J., Lane, S. N. and Simpson, C. J. (2013) **Deposits of the sandy braided South Saskatchewan River: implications for the use of modern analogues in reconstructing channel dimensions in reservoir characterisation** (<http://archives.datapages.com/data/bulletns/aop/20130114/aapgbtln11152aop.html>) *Bulletin of the American Association of Petroleum Geologists*. ISSN 0002-7464

Parker, N. O., **Sambrook Smith, G. H.**, Ashworth, P.J., Best, J. L., Lane, S. N., Lunt, I. A., Simpson, C. J. and Thomas, R. E. (2013) **Quantification of the relationship between surface morphodynamics and subsurface sedimentological product in sandy braided rivers** (<http://onlinelibrary.wiley.com/doi/10.1111/j.1365-3091.2012.01364.x/abstract>) *Sedimentology* . ISSN 0037-0746

Hitchman, A., **Sambrook Smith, G.H.**, Sterling, M., Yu-Nam, Y.K. and Lead, J. (2013) **The effect of environmentally relevant conditions on PVP stabilised gold nanoparticles.** (<http://www.sciencedirect.com/science/article/pii/S0045653512009721>) *Chemosphere*.

Nicholas, A. P., Sandbach, S. D., Ashworth, P.J., Amsler, M. L., Best, J. L., Hardy, R. J., Lane, S. N., Orfeo, O., Parsons, D. R., Reesink, A. J. H., **Sambrook Smith, G. H.** and Szupiany, R. N. (2012) **Modelling hydrodynamics in the Rio Paraná, Argentina: an evaluation and inter-comparison of reduced-complexity and physics-based models applied to a large sand-bed river** (<http://www.sciencedirect.com/science/article/pii/S0169555X12002413>) *Geomorphology*, 169-170 . pp. 192-211. ISSN 0169-555X

Fielding, Christopher R., Ashworth, P.J., Best, J. L., Prokocki, Eric W. and **Sambrook Smith, G. H.** (2012) **Tributary, distributive and other fluvial patterns; what really represents the norm in the continental rock record (invited review)** (<http://www.sciencedirect.com/science/article/pii/S0037073812000723>) *Sedimentary Geology*, 261-262 . pp. 15-32. ISSN 0037-0738

Blois, G., **Sambrook Smith, G.H.**, Best, J.L., Hardy, R.J. and Lead, J.R. (2012) **Quantifying the dynamics of flow within a permeable bed using time-resolved endoscopic particle imaging velocimetry (EPIV)** (<http://link.springer.com/article/10.1007%2Fs00348-011-1198-8>). *Experiments in Fluids*, doi: 10.1007/s00348-011-1198-8.

Ashworth, P.J., **Sambrook Smith, G.H.**, Best, J.L., Bridge, J.S., Lane, S.N., Lunt, I.A., Reesink, A.J.H., Simpson, C.J. and Thomas, R.E. (2011) **Evolution and sedimentology of a channel fill in the sandy braided South Saskatchewan River and its comparison to the deposits of an adjacent compound bar.** (<http://onlinelibrary.wiley.com/doi/10.1111/j.1365-3091.2011.01242.x/abstract>) *Sedimentology*, doi: 10.1111/j.1365-3091.2011.01242.x.

**Sambrook Smith, G.H.**, Best, J.L., Ashworth, P.J., Lane, S.J., Parker, N.O., Lunt, I.A., Thomas, R.E. and Simpson, C.J. (2010) **Can we distinguish flood frequency and magnitude in the sedimentological record of rivers?** (<http://geology.gsapubs.org/content/38/7/579.abstract>) *Geology*, 38, 579-582.

Lane, S.N., Widdison, P.E., Thomas, R.E., Ashworth, P.J., Best, J.L., Lunt, I., **Sambrook Smith, G.H.**, Simpson, C.L. (2010) **Quantification of braided river channel change using archival digital image analysis.** (<http://onlinelibrary.wiley.com/doi/10.1002/esp.2015/abstract>) *Earth Surface Processes and Landforms*, 35, 971-985.

**Sambrook Smith, G. H.**, Ashworth, P. J., Best, J. L., Lunt, I. A., Orfeo, O. and Parsons, D. R. (2009) **The sedimentology and alluvial architecture of a large braid bar. Río Paraná, Argentina.** (<http://sedres.geoscienceworld.org/content/79/8/629.short>) *Journal of Sedimentary Research*, 79, 629-642.

