

# Stuart William David Grieve

Lecturer in Physical Geography

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## Appointments

2018– **Lecturer in Physical Geography**, Queen Mary University of London  
2017–2018 **Research Software Developer**, University College London  
2017 **Lecturer in Physical Geography**, Queen Mary University of London  
2016–2017 **Postdoctoral Research Associate**, University of Edinburgh  
*Topographic analysis and landslide modelling software.*  
2016 **Research Assistant**, Cardiff University

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## Education

2013–2016 **Ph.D. in Atmospheric and Environmental Sciences** University of Edinburgh  
*Uncovering signatures of geomorphic process through high resolution topography.*  
Supervisors: Professor Simon M Mudd and Dr Tristram C Hales (Cardiff University)  
  
2011–2012 **M.Sc. in Geographical Information Science** (Distinction) University of Edinburgh  
Thesis Title: *An automated analysis of the southern San Andreas Fault to explore topography's relationship with tectonics.*  
Supervisor: Professor Simon M Mudd  
  
2007–2011 **B.Sc. (Hons.) in Geology and Physical Geography** (2:1) University of Edinburgh  
Thesis Title: *The Influence of Climate Change on Landslide Sediment Yields in the Northern Lake District.*

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## Awards

2017 **Software Sustainability Institute Fellowship**  
Awarded to support my work developing sustainable geoscience software  
  
2017 **Wiley Award** from the British Society for Geomorphology  
Awarded for the best paper published in *Earth Surface Processes and Landforms* in 2016

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## Research Statement

My research aims to develop an understanding of how signals of change, such as those driven by tectonics or the environment, manifest in the surface morphology of the Earth and other planetary bodies. In particular, I aim to bridge the gap between numerical models, remotely sensed data and field observations and I conduct such research through the development of open source software which facilitates reproducible analysis, with a particular focus on the processing of high resolution topographic data. Such software allows repeatable experiments to be performed on both terrestrial and planetary landscapes, at a range of scales spanning

individual hillslopes to continental scale features. I also work on the development and application of cutting edge GIS and computer science techniques to enhance surface process research, through the analysis of complex spatial information combined with novel data collection approaches and high performance computing.

## Teaching Statement

My teaching, as with my research, focuses on the implementation and application of quantitative and computational methods, as a framework to understand Earth surface processes. I am passionate about engaging students to interpret landscapes and the processes which act upon them both in a classroom and field setting. I have experience of teaching theoretical and applied GIS, either within the context of physical geography or a number of other disciplines (transport planning, infrastructure, crime research, archaeology) at both an undergraduate and postgraduate level. Aside from teaching physical geography and GIS, I also enjoy teaching scientific programming to students, giving them a grounding in data analysis and visualisation which can be employed throughout their time in education and beyond. Such skills are vital for students and I believe I am well placed to teach these skills within a physical science context.

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## Technical Skills

Accomplished programmer comfortable with object orientated concepts and a range of languages (**C++**, **Python**, **Java**) and the use of version control (**git**, **subversion**) to manage large projects. Extensive experience in desktop (**ArcGIS**, **FME**, **Whitebox**, **QGIS**) and web based (**MapBox**, **Mapguide**) GIS to solve complex spatial problems. Managing large spatial and non-spatial datasets using SQL databases (**Oracle**, **PostgreSQL**, **MySQL**, **SQLite**). Development of novel geospatial analyses to answer scientific questions. Processing raw LiDAR point clouds to produce bare earth DEMs.

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## Other Employment

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| 2015–2016 | <b>GIS Consultant and Field Course Leader</b> , GeoBus, University of St Andrews |
| 2012–2013 | <b>GIS Trainee</b> Forth Crossing Bridge Constructors                            |

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## Publications

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|------|--|
| 2018 | <b>Grieve, S.W.D.</b> , Hales, T.C., Parker, R.N, Mudd, S.M., Clubb, F.J., <i>Controls on zero-order basin morphology</i> . J. Geophys. Res. Earth Surf., doi:10.1029/2017JF004453                       |
| 2017 | <b>Grieve, S.W.D.</b> , <i>spatial-efd: A spatial-aware implementation of elliptical Fourier analysis</i> . JOSS, doi:10.21105/joss.00189  |
| 2016 | <b>Grieve, S.W.D.</b> , Mudd, S.M., Hurst, M.D., <i>How long is a hillslope?</i> Earth Surf. Process. Landforms. doi:10.1002/esp.3884  |
| 2016 | <b>Grieve, S.W.D.</b> , Mudd, S.M., Hurst, M.D., Milodowski, D.T., <i>A nondimensional framework for exploring the relief structure of landscapes</i> . Earth Surf. Dynam., doi:10.5194/esurf-4-309-2016 |

- 2016 **Grieve, S.W.D.**, Mudd, S.M., Milodowski, D.T., Clubb, F.J., Furbish, D.J., *How does grid-resolution modulate the topographic expression of geomorphic processes?* Earth Surf. Dynam., doi:10.5194/esurf-4-627-2016
- 2016 Parker, R.N., Hales, T.C., Mudd, S.M., **Grieve, S.W.D.**, Constantine, J.A., *Colluvium supply in humid regions limits the frequency of storm-triggered landslides.* Sci. Rep., doi:10.1038/srep34438
- 2016 Mudd, S. M., Harel, M.-A., Hurst, M. D., **Grieve, S.W.D.**, and Marrero, S. M., *The CAIRN method: Automated, reproducible calculation of catchment-averaged denudation rates from cosmogenic radionuclide concentrations,* Earth Surf. Dynam., doi:10.5194/esurf-4-655-2016
- 2016 Clubb, F.J., Mudd, S.M., Attal, M., Milodowski, D.T., and **Grieve, S.W.D.**, *The relationship between drainage density, erosion rate, and hilltop curvature: implications for sediment transport processes,* J. Geophys. Res. Earth Surf., doi:10.1002/2015JF003747
- 2014 Mudd, S.M., Attal, M., Milodowski, D.T., **Grieve, S.W.D.**, Valters, D.A., *A statistical framework to quantify spatial variation in channel gradients using the integral method of channel profile analysis.* J. Geophys. Res. Earth Surf., doi:10.1002/2013JF002981

## Conference Presentations

### INVITED TALKS

- 2017 **Grieve, S.W.D.**, *Geomorphic insight from high resolution topography: Is it reproducible?* Wiley Award Keynote Lecture, BSG Annual General Meeting, Hull
- 2016 **Grieve, S.W.D.**, *Uncovering signatures of geomorphic process through high resolution topography.* Presented at The Hutton Club, University of Edinburgh.
- 2015 **Grieve, S.W.D.**, *Reproducible geographic analysis: Insights from geomorphology.* Presented at GIS Update, Edinburgh.

### ORAL PRESENTATIONS

- 2018 Singer, M.B., **Grieve, S.W.D.**, Chen, S-a, Michaelides, K., *Climatic Signatures Within the World's Rivers.* Presented at the AGU Fall Meeting, Washington, D.C. Orleans.
- 2018 Clubb, F.J., Mudd, S.M., Hurst, M.D., **Grieve, S.W.D.**, *Tectonics vs. eustasy: fluvial terraces, channel profiles, and hillslopes at the Mendocino Triple Junction, California* Presented at the EGU General Assembly, Vienna.
- 2017 Mason, L., Hetherington, J., O'Reilly, M., Yong, M., Jersakova, R., **Grieve, S.W.D.**, Perez-Suarez, D., Klapaukh, R., Craster, R.V. and Matar, O.K., *Working research codes into fluid dynamics education: a science gateway approach.* Presented at The APS Division of Fluid Dynamics, Denver.
- 2016 Mudd, S.M., Sinclair, H.D., LeDivellec, T., Dallas, K., **Grieve, S.W.D.**, *A single event in the Ladakh Himalaya resulted in erosion equivalent to greater than 1000 years of the average erosion rate.* Presented at the BSG Annual General Meeting, Plymouth.
- 2015 **Grieve, S.W.D.**, Mudd, S.M., Hurst, M.D., *Constraining hillslope sediment flux using high resolution topographic data.* Presented at the BSG Annual General Meeting, Southampton.

- 2015 Clubb, F.J., Mudd, S.M., Attal, M., Milodowski, D.T., **Grieve, S.W.D.**, *The Relationship between Drainage Density, Erosion Rate, and Hilltop Curvature: Implications for Sediment Transport Processes*. Presented at the BSG Annual General Meeting, Southampton.

#### POSTER PRESENTATIONS

- 2018 Chen, S-a, Michaelides, K., **Grieve, S.W.D.**, Singer, M.B., *Climatic Controls on River Longitudinal Profiles Globally*. Presented at the AGU Fall Meeting, Washington, D.C. Orleans.
- 2018 **Grieve, S.W.D.**, Hales, T.C., Parker, R.N., Mudd, S.M., Clubb, F.J., *Understanding the relationship between colluvial hollow morphology and hillslope processes*. Presented at the EGU General Assembly, Vienna.
- 2017 Clubb, F.J., Mudd, S.M., Hurst, M.D., **Grieve, S.W.D.**, *Unsteady Landscapes: Fluvial Terraces, Channel Profiles, and Hillslopes at the Mendocino Triple Junction, California*. Presented at the AGU Fall Meeting, New Orleans.
- 2016 Hales, T.C., Parker, R.N., Mudd, S.M., **Grieve, S.W.D.**, *How do Colluvial Hollows Fill?* Presented at the AGU Fall Meeting, San Francisco.
- 2016 Hurst, M.D., **Grieve, S.W.D.**, Mudd, S.M., *Coupled analysis of hillslope and channel metrics for erosion rates in a tectonically active landscape*. Presented at the AGU Fall Meeting, San Francisco.
- 2016 **Grieve, S.W.D.**, Mudd, S.M., Milodowski, D.T., Clubb, F.J., Furbish, D.J., *How does the resolution of topographic data impact the measurement of geomorphic processes?* Presented at the BSG Annual General Meeting, Plymouth.
- 2016 Mudd, S.M., Hurst, M.D., **Grieve, S.W.D.**, Milodowski, D.T., Clubb, F.J., Attal, M., *Detecting geomorphic processes and change with high resolution topographic data*. Presented at the EGU General Assembly, Vienna.
- 2015 Mudd, S.M., **Grieve, S.W.D.**, Milodowski, D.T., Hurst, M.D., Clubb, F.J., Valters, D.A., *LSD-TopoToolBox: Open source geomorphology*. Presented at the BSG Annual General Meeting, Southampton.
- 2015 Clubb, F.J., Mudd, S.M., Attal, M., Milodowski, D.T., **Grieve, S.W.D.**, *The Relationship between Drainage Density, Erosion Rate, and Hilltop Curvature: Implications for Sediment Transport Processes*. Presented at the AGU Fall Meeting, San Francisco.
- 2015 Parker, R.N., Hales, T.C., Mudd, S.M., **Grieve, S.W.D.**, *Precipitation and soil accumulation history modifies future landslide hazard*. Presented at the AGU Fall Meeting, San Francisco.
- 2015 Parker, R.N., Hales, T.C., Mudd, S.M., **Grieve, S.W.D.**, *Climate change has limited impact on soil-mantled landsliding*. Presented at the EGU General Assembly, Vienna.
- 2014 **Grieve, S.W.D.**, Mudd, S.M., Hales, T.C., *How long is a hillslope?* Presented at the AGU Fall Meeting, San Francisco.
- 2014 Mudd, S.M., Attal, M., Milodowski, D.T., **Grieve, S.W.D.**, Valters, D.A., *A statistical technique for identifying channels of different steepness in transient landscapes*. Presented at the EGU General Assembly, Vienna.

## Classroom Teaching Experience (Course Level)

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| 2018–     | Environmental Hazards, Lecturer (3rd year)  |
| 2018–     | Geomorphology, Lecturer (2nd year)  |
| 2018–     | Geography in the World, Lecturer (1st year)   |
| 2017–     | Research Software Engineering with Python, Lecturer (M.Sc.)                                 |
| 2016      | Quantitative Methods in Earth Sciences, Laboratory Demonstrator (3rd year)                  |
| 2015      | Geomorphology, Laboratory Demonstrator and Tutor (2nd year)                                 |
| 2014–2015 | Object Oriented Software Engineering Principles, Laboratory Demonstrator (M.Sc.)            |
| 2014–2015 | Object Orientated Software Engineering: Spatial Algorithms, Laboratory Demonstrator (M.Sc.) |
| 2014–2015 | Principles of Geographical Information Science, Laboratory Demonstrator (M.Sc.)             |
| 2014–2015 | Introduction To Spatial Analysis, Laboratory Demonstrator (M.Sc.)                           |
| 2014–2015 | Distributed GIS, Laboratory Demonstrator (M.Sc.)  |
| 2014–2015 | Spatial Modelling, Laboratory Demonstrator (M.Sc.)  |
| 2014      | Earth Surface Systems Course Assistant (1st year)   |
| 2014      | Fundamental Methods in Geography, Laboratory and Field Demonstrator (2nd year)              |
| 2013–2016 | Geo-Visualisation, Laboratory Demonstrator (M.Sc.)  |
| 2013–2015 | Advanced Spatial Database Methods, Laboratory Demonstrator (M.Sc.)                          |
| 2013–2015 | Further Spatial Analysis, Laboratory Demonstrator (M.Sc.)                                   |
| 2013–2014 | Earth Surface Systems, Laboratory Demonstrator and Tutor (1st year)                         |

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## Field Teaching Experience (Course Level)

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| 2017      | Fieldwork in Physical Geography and Environmental Science (1st year) |
| 2014–2015 | Cyprus field course (4th year honours)                               |
| 2014      | Fundamental Field Methods in Geography (2nd year)                    |

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## Service

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| 2018–     | <b>Reviewer:</b> The Journal of Hydrology   |
| 2017–     | <b>Reviewer:</b> The Journal of Open Source Software  |
| 2017–     | <b>Reviewer:</b> Earth Surface Dynamics   |
| 2016–     | <b>Reviewer:</b> Entropy  |
| 2016–     | <b>Reviewer:</b> Earth Surface Processes and Landforms.   |
| 2015      | <b>Currency Reviewer:</b> Reference Module in Earth Systems and Environmental Sciences, Elsevier. |
| 2014–2015 | <b>Session Chair</b> M.Sc. GIS postgraduate conference, University of Edinburgh.                  |

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## Funding Received

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| 2017 | British Society for Geomorphology Outreach Grant: <i>GeoBus: River in a box</i><br>P.I.: Stuart W. D. Grieve<br>Co. I: Charlotte J Pike<br>Award: <b>£900</b> |
| 2014 | British Society for Geomorphology Student Travel Grant<br>Award: <b>£750</b>  |
| 2014 | NERC Cosmogenic Isotope Analysis Facility: <i>Hillslope-channel coupling in a steady-state landscape.</i>   |

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PI.: Tristram Hales (Cardiff University)

Co. I.: Simon M. Mudd, Robert Parker (Cardiff University) and Stuart W. D. Grieve

Award: **£19,320**

2013 Safe Software Grant Program  
Award: **Software licence for FME Desktop Edition**

2011 SAAS Postgraduate Students' Allowances Scheme  
Award: **£3400**

2011 University of Edinburgh Postgraduate Bursary  
Award: **£1300**

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## Professional Memberships

2014– American Geophysical Union

2014– British Society for Geomorphology