

# Mike Spencer

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## EDUCATION

### UNIVERSITY OF EDINBURGH

PHD IN SNOW HYDROLOGY  
June 2016

### LANCASTER UNIVERSITY

BSC IN ENVIRONMENTAL SCIENCE  
June 2004

## LINKS

Blog: [scottishsnow](#)  
Twitter: [@MikeRSpencer](#)  
LinkedIn: [mikerspencer](#)  
StackExchange: [mikerspencer](#)

## MEMBERSHIP

British Hydrological Society  
Royal Meteorological Society  
Royal Statistical Society

## SKILLS

### COMPUTING

Operating systems:  
Linux (Debian based) • Microsoft  
Windows  
Programming  
R • SQL •  $\text{\LaTeX}$  • Git • Bash • HTML  
Spatial:  
QGIS • GRASS • ArcGIS • MapInfo Pro  
Other:  
Microsoft/Libre Office • Desktop  
publishing, e.g. Scribus • Most  
hydrological and hydraulic modelling  
software, e.g. ISIS, HEC, FEH, TUFLOW

### DATA

Types:  
Gridded (e.g. satellite): NetCDF, rasters,  
hdf, images • SQL/databases • Time  
series • Numeric • Categorical (e.g.  
social)  
Abilities:  
Mining/extraction • Wrangling/munging  
• Management • Quality assurance •  
Repeatability • Exploration • Analysis •  
Modelling: statistics/physically  
based/machine learning • Visualisation •  
Forecasting • Interpretation • Insight

## ABOUT

### OVERVIEW

Mike is a PhD educated data scientist. His data analysis language of choice is R, but he is keen to develop other skills as projects require. He enjoys diverse work challenges and has been employed in the public, private and academic sectors, giving him the edge in situations that require quick learning and adaptability.

Mike works with a broad range of data types (e.g. time series, spatial, numerical, categorical, etc.), stored in a variety of formats (spreadsheet, SQL, csv, etc.). As a PhD researcher, he's able to scrape and mine data, as required, and manage it in the most appropriate, tidy format. He has extract, transform and load (ETL) skills, which he uses to prepare data for analysis. Mike uses physically-based modelling, statistics and machine learning to gain insight from data and make forecasts. As you can see from the output section, he is very capable of presenting his work to a wide variety of audiences.

### INTERESTS

- Repurposing existing data to answer real world questions.
- Making data analysis scalable and repeatable.
- Using data science methods to improve workflows.

## SKILLS PORTFOLIO

### DATA ANALYSIS

- [These results](#) from an analysis of UK climate data show Mike's ability to fit a regression model across a number of factors. This analysis is hosted [here](#).
- Mike is currently working on a fuel poverty map using decision tree machine learning. This will be available soon.

### DATA VISUALISATION

- Following snowfall across Britain in April 2016, Mike wrote [this blog post](#), which shows the frequency of monthly snow cover. It contains plots which visualise complex spatial and temporal data.
- Mike is building an interactive Shiny app to visualise summary data from the Snow Survey of Great Britain. This will be available soon.

### PROGRAMMING

- Mike uses Git to version control his work. You can find him on [Github](#) and [Bitbucket](#), note that some repositories are private.
- Mike is active on Stack Exchange. Example answers include [raster resolution](#) and [working with logicals](#).

### GIS

- [This GIS network analysis](#) shows the shortest road distance between 1.6 million GB postcodes and the closest train station. This analysis uses Ordnance Survey OpenData.
- An example of Mike's cartography skill is [this map](#), highlighting different elevations visible from a point in the Cairngorm mountains.

## OUTPUT

### ARTICLES

(Click titles for links, where available)

Spencer, M. & Essery, R., *Reanalysis of potential snowmelt in a temperate climate*, Journal of Hydrology, **in prep.**

Spencer, M. & Essery, R., *Scottish snow cover dependence on the North Atlantic Oscillation index*, Hydrology Research, **2016**.

Hollebrandse, F., Spencer, M. & Nutt, N., *Open Hydrology launches open-source flood estimation software*, British Hydrological Society Circulation No. 125, **2015**.

Reid, T., Spencer, M., Huntley, B., Hancock, S., Essery, R., Carle, J., Holden, R., Baxter, R. & Rutter, N., *Spatial quantification of leafless canopy structure in a boreal birch forest*, Agricultural and Forest Meteorology, **2014**, 188, 1-12.

Spencer, M., Essery, R., Chambers, L. & Hogg, S., *The Historical Snow Survey of Great Britain: Digitised Data for Scotland*, Scottish Geographical Journal, **2014**, 130, p252-265.

### TALKS (SELECTED)

*Snow, R and keeping people safe*, EARL, Sep **2016**

*Scottish snow*, EdinbR, Jun **2016**

*Reanalysis of Scottish mountain snow*, EUBAP seminar, Mar **2016**

*Time series rasters and the free and open source approach*, QGIS user group, Oct **2014**

*Scottish snow cover and the North Atlantic Oscillation*, British Hydrological Society (BHS) symposium, Sep **2014**

*Arctic river discharge and the search for a climate change signal*, Contemporary climate seminar, Jul **2014**

*The Historical Snow Survey of Great Britain: Digitised Data for Scotland*, Scottish hydrological group, Oct **2013**

*Scottish snowline observations - the past and future*, BHS symposium, Jul **2012**

*Reanalysis of Scottish mountain snow observations*, Northern Rivers Institute seminar, Apr **2012**

### POSTERS (SELECTED)

*Snowmelt frequency in a mountainous, temperate, maritime environment*, International conference on alpine meteorology, Sep **2015**

*Snow survey of Great Britain: digitised data for Scotland*, BHS symposium, Sep **2014**

*Scottish snow - a viable dataset*, International Glaciological Society, Sep **2013**

## RESEARCH

### UNIVERSITY OF EDINBURGH | PhD

Sep 2011 - Jun 2016 | Edinburgh, Scotland

- Stochastic time series snow modelling.
- Extreme value statistics of snow cover and melt.
- Spatial statistics modelling of snow cover dependence on large scale atmospheric circulation indicators (NAO).
- Analysis of Scottish satellite snow observation veracity.
- Data mining of historic Snow Survey of Great Britain dataset.

### LISTED JOURNALS | REVIEWER

Climatic Change • Environmental modelling and software • Geoscientific model development

## INDUSTRY

### HALCROW GROUP LTD | SENIOR HYDROLOGIST

Sep 2008 - July 2011 | Edinburgh, Scotland

- Project lead for Scottish hydrological work.
- Training and mentoring of staff.
- Project and package management.
- Flood forecasting model design and build.
- Hydrological, hydraulic and GIS modelling and analysis.

### ENVIRONMENT AGENCY WALES | HYDROLOGIST

Dec 2005 - Sep 2008 | Haverfordwest, Wales

- Extreme value flood statistics.
- Hydrology, hydraulics and GIS modelling and analysis, with quality assurance.
- Data management of flood risk assessments, hydraulic models and GIS output.
- Flood warning duty officer; forecasting and dissemination.

## VOLUNTEERING

### SCOTTISH YOUTH HOSTELS ASSOCIATION | DIRECTOR

Jun 2016 - ongoing | Edinburgh, Scotland

- Responsible for governance of SYHA.
- Member of Governance Nomination Committee.

### SCHOOL OF GEOSCIENCES GRADSCHOOL | CHAIR

Feb 2012 - Jan 2013 | Edinburgh, Scotland

- Committee chair representing 200 GeoScience PhD students.
- Ran 3 day conference with 120 delegates from university and industry.
- Raised £15000 through industry sponsorship, as part of £25000 budget.

## TEACHING

### UNIVERSITY OF EDINBURGH | LECTURER, DEMONSTRATOR

Sep 2011 - ongoing | Edinburgh, Scotland

- 4x MSc and 1x BSc students researching GIS, flood management and climate.
- MSc and PhD lecturing in water resources and skills development.
- Undergraduate demonstrating in subject specific courses and skills development.

## PERSONAL

Mike has been based on the outskirts of Edinburgh since Autumn 2008. He balances his work commitments with a young family, taking a day out a week for parenting. When he's not at a computer Mike can be found on a bike, mountain, up a ladder doing DIY or gigging as a trombonist.