Dr Harry Gibson

Personal Details	**Location**: North Oxfordshire, United Kingdom **Phone**: +44 (0)7967 730049 **Email**: harry.s.gibson@gmail.com **Portfolio**: https://harry-gibson.github.io
Profile	I am a GIS analyst, developer, and data scientist, with experience in diverse sectors and a range of client facing roles. I am currently working in the Malaria Atlas Project in the Big Data Institute at the University of Oxford, where I provide expertise on processing very large (multi-terabyte) global satellite data archives, and on analysis and web dissemination of remotely-sensed and other spatial data. I previously worked on the development of spatial aspects of flood risk modelling in the UK and was involved in producing web based tools to help users understand and access the data. I also developed tools to automate processing of flood defence data, enabling more efficient generation of the National Flood Risk Assessment for England. I enjoy using GIS and data science tools to help people get the most value out of the information available.

Key skills summary	**GIS analysis and development**
	
	- Substantial experience (15 years+) of the ESRI ArcGIS Desktop suite (all versions), including ArcGIS for Desktop and ArcGIS Pro, Server, and Online. Development of Arcmap tools and extensions in C# / .NET and automation of ArcGIS applications.
	- Extensive skills in developing high-performance and complex spatial data processing, manipulation, and distribution workflows, particularly in Python (and libraries such as GDAL/OGR, Numpy, Cython and ArcPy) and in FME
	- I currently specialise in raster-based processing and analysis, generally through writing bespoke high-performance code in languages including Python and C#
	- Use of Google Earth Engine (GEE) for large-scale data processing and distribution
	
	General Software Development
	
	- Background in computer science and have regularly worked in languages including Python, C# .NET, **Javascript**, **Java**, **SQL** (**PostgreSQL** and **PostGIS**)
	- Advanced user (10+ years' experience) of **FME** (Desktop and Server) for authoring complex data processing workflows
	- I excel in rapidly getting to grips with the relevant information and structure in new datasets, whether spatial or non-spatial, and providing tools to help users extract the necessary information from them.
	- As such I use whatever is the right tool for the job at hand, upskilling if necessary
	  - Development of algorithms to efficiently process extremely large (many terabyte) raster data (using languages and libraries such as Python, GDAL and Cython)
	  - Design and development of advanced data processing workflows using tools including FME, SQL and Python – for example to automate the processing and manipulation of large and disparate demographic survey datasets
	  - Use of FME Server to enable users to "self serve" with GIS data processing and retrieval including developing web and other interfaces.
	- Working familiarity with many aspects of the Google Cloud Platform
	
	Other
	
	- Regular development activities and courses undertaken to extend and update skills: recent examples include Google Earth Engine summits, Google Cloud Platform summit and training, delivering raster processing training to colleagues, presenting work at an FME user conference, receiving and delivering regular GIS training through MapAction (see below), and membership of the British Hydrological Society
	- I have a broad science background and interests, enabling lateral thinking and rapid mastery of new skills (e.g. change of work area from hydrology to epidemiology)

Voluntary work	**MapAction (www.mapaction.org)**
	Since 2015 I have been a volunteer with the disaster response charity MapAction. The organisation comprises an international group of GIS experts and humanitarians and its primary function is to provide mapping support to humanitarian organisations during an in-country disaster response. Volunteering involves regular weekend training in GIS and other related subjects; providing support to field teams during deployments; and (where appropriate) volunteering to deploy to a disaster response. Additionally I am a member of the Software Development Group, developing the tools which underpin the organisation's technical ability to achieve all of these aims.

Employment

September 2014 – Present

Senior Business Analyst (Geospatial & Malariometric Data) (www.ox.ac.uk)

(Sept 2014 – April 2017 as GIS Data Archive Developer)

- I work in the Malaria Atlas Project, in the Oxford Big Data Institute. The group studies the spread of tropical diseases such as malaria and provides key advice to organisations including the WHO
- I am responsible for developing and maintaining the group's archive of raster datasets (for example spatio-temporal stacks of satellite-derived temperature maps, and ensemble model outputs). I have developed and improved high-performance algorithms and workflows based on open source software to work with these massive data
- I also provide expertise on processing other datasets such as demographic and census information (e.g. parsing census surveys to extract malaria epidemiology), and coordinate the work of our Data Assistants to gather and process data from reports and other literature sources

August 2012 – September 2014

GIS Developer – HR Wallingford (www.hrwallingford.com)

Developing GIS software, tools, and data processing workflows, working within the Floods group on projects relating to the national strategic assessment and management of flood risk. Work included:

- Extension of the MDSF2 software (in C#, based in ArcGIS) to help measure and communicate flood model uncertainty. MDSF2 is the probabilistic flood estimation tool used for the development of the National Flood Risk Assessment
- Upgrade and redevelopment of the UK SUDS sustainable drainage design support website http://www.uksuds.com, then written in Javascript using Dojo
- Development of advanced FME workflows to develop a national Continuous (Flood) Defence Line, enabling users to spend less time on laborious GIS editing and more time understanding real issues
- Designing and implementing a service to allow clients to extract data from the US National Flood Hazard database and understand the results, through a simple FTP based upload / download interface and FME Server processing

August 2009 – August 2012

Spatial Data Analyst – Centre for Ecology and Hydrology (www.ceh.ac.uk)

GIS analysis, web development, data management and support, working within the National River Flow Archive (NRFA) and other hydrology-based science projects. Work included:

- Providing GIS analysis and support to a wide range of hydrological science projects including study of extreme rainfall events and drought trends
- Development and maintenance of server / web based tools, using the ArcGIS Javascript API and server-side development, to encourage widespread use of GIS technology and allow non-GIS users to take advantage of GIS data and analysis (e.g. derivation of river catchments and statistics through a web interface)

- Rationalisation and management of spatial data holdings into a consistent and centralised database system, integrated with other major data holdings in the organisation such as time-series data

July 2007 – August 2009

Environmental Consultant – Haycock Associates Ltd (www.hec-ltd.co.uk)

A varied client facing role in a small environmental consultancy, specialising in soil, land and water management and modelling. Work included:

- Hydraulic modelling for flood risk assessment or other client needs
- Floodplain modelling, particularly in rural areas, using modelling tools including HEC-RAS and LISFLOOD-FP
- Spatial analysis and map production using a wide range of GIS tools and data
- Involved with full project lifecycles from tendering, project management, software and engineering development, to implementation of on-the-ground solutions such as flood mitigation schemes

Education	**2002 – 2006 University of Durham**

PhD in Environmental Sciences (viva passed March 2007)

Title: Sources and Management of Water Colour in the River Tees

Study combined extensive fieldwork in remote / upland locations, with GIS and statistical data analysis. Project strands (full details available online here):

- Monitoring and hydrological evaluation of the effects of moorland ditch blocking on increasing water colour levels exported from upland peats
- Collection and creation of a range of GIS datasets relating to a river catchment, including aerial photography, OS mapping, and numerical published data
- Statistical comparison of behavioural differences between blocked / unblocked moorland ditches
- GIS-based evaluation of land-use factors contributing to water colour in rivers, to set the behaviour of small-scale peat ditches in a wider-scale context

1999 – 2002 University of Durham

BSc(Hons) Natural Sciences, First Class

Combined science degree majoring in Computer Science and Environmental Science / Hydrology, also including GIS, Physics, Mathematics

1992 – 1998 Royal Latin School, Buckingham

A levels: Physics (A); Chemistry (A); Mathematics (B); French (B)

13 GCSEs: 6 grade A*; 3 grade A; 4 grade B

Languages	Good French comprehension; moderate conversational level