ANDREW WATSON

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EDUCATION AND EMPLOYMENT

University of Leeds, Department of Earth and Environment *October 2018 - Present*
Postgraduate Researcher

Durham University, Department of Earth Sciences *September 2017 - September 2018*
Masters by Research

Durham University, Department of Earth Sciences *October 2014 - July 2017*
BSc in Geophysics with Geology, *First Class Honours*

Carmel College, Darlington July 2016
Teaching intern - National College for Teaching and Leadership

Blackwell Post Office, Darlington July 2014 - September 2015
Post office assistant

Carmel College, Darlington 2007 - 2014
A levels: Mathematics (A), Geography (A*), Physics (A) and Chemistry (A)*

TECHNICAL SKILLS

Computer Languages	MATLAB, Python, Bash
Software	LaTeX, Microsoft Office, Google Earth Engine
Satellites	Sentinel-1 (radar), Envisat, Sentinel-2 (optical)

PROJECTS

Understanding the co-evolution of mountain building and seismic hazard in Iran
PhD Project

Convergence between the Arabian and Eurasian plates is driving complex deformation and frequent earthquakes throughout Iran. Knowledge of how the crust is deforming is critical both for our understanding of the large-scale plate dynamics, and for accurate assessment of seismic hazard.

I utilise the extensive catalogue of Sentinel-1 satellite imagery to measure ground deformation across the country, focusing on known faults that lack well-constrained characteristics. This involves large-scale data processing on remote super-cluster facilities, thorough understanding of error sources and correction techniques, and the ability of analyse both tectonic and non-tectonic signals.

Geodetic network design for low-cost GNSS stations
Masters Thesis

GNSS stations are used to measure pre-, co-, and post-seismic ground deformation around faults. While possessing high accuracy and temporal resolutions, the prohibitive cost of traditional units leads to low spatial resolutions. Geospatial Research Ltd., a spin-out company within Durham University, is developing low-cost stations to address this weakness. Effective use of large numbers of stations requires knowledge of the optimum locations to deploy them. As part of my MSc, I have written software to generate the optimum geodetic network for measuring co- or post-seismic deformation around a given fault. As part of this, the optimum discretisation of the fault plane is also found. This has required knowledge of the MATLAB language, network design, inverse theory, optimisation, and fault dynamics.

Application of atmospheric corrections to InSAR measurements of low magnitude earthquakes in Iran
Undergraduate Dissertation

I used Envisat InSAR observations to measure earthquake deformation signals, applying atmospheric corrections to push the sensing limits of the technique.

AWARDS AND PRESENTATIONS

Stephen Mills Postgraduate Studentship - UK/EU tuition fees studentship awarded for a MSc by research

Nippress, S. E. J., Heyburn, R. G., Walters, R. J., Watson, A. (2016). Relocation and Seismicity of the aseismic central Iranian plateau. *In AGU Fall Meeting Abstracts.*

Watson, A., Walters, R., McCaffrey, K., Wilkinson, M., Penna, N. (2018). Geodetic Network Design for Low-Cost GNSS. *Presented at the 19th General Assembly of WEGENER, 10-13 Sept.*

Understanding the co-evolution of mountain building and seismic hazard in regions of continental convergence. *Presented at Mesure de la Déformation par Imagerie Satellitaire 2019 and the COMET Annual General Meeting (2018 2019).*

EXTRAS

Organiser of the both the Tectonics and Geodesy research groups and the University of Leeds.

Rewrote the University of Leeds Tectonophysics module from MATLAB to Python.

Taught on the four day NERC Numerical Modelling course at Durham University in 2018.

Demonstrated for undergraduate models on numerical modelling, geophysical data interpretation, inverse theory, and led tutorials on introductory geophysics.

Held two exec positions in the Durham University Mountaineering Society, organising multi-day trips for up to 30 people and managing the societies finances.