

## Dr Lesley Batty

Senior Lecturer in Environmental Science

**[School of Geography, Earth and Environmental Sciences \(/schools/gees/index.aspx\)](/schools/gees/index.aspx)**

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### About

Lesley Batty is a Senior Lecturer in Environmental Science (teaching focussed) and brings her enthusiasm and expertise in this area to all aspects of her work. She is also Senior Tutor for GEES, responsible for ensuring that all our students have a great experience during their studies in the School.

She has a particular interest in the ecology of industrial pollution and has spent a lot of time working in and around old metal and coal mines. Lesley is also highly active outside Birmingham and has published several textbooks, acts as associate editor for the Journal of Geochemical Exploration and is a key member of the British Ecological Society.

### Feedback and office hours

Office Hours for Semester 2: Tuesdays 3.30-4.30 and Wednesdays 9.30-10.30

### Qualifications

PhD University of Sheffield

MRes Earth and Atmospheric Sciences, University of Reading

BSc (Hons) Natural Environmental Science, University of Reading

Postgraduate Certificate in Learning and Teaching, University of Birmingham

### Teaching

I am a teaching focussed member of staff with a commitment to providing innovative research-led teaching. I have been responsible for the development of innovative educational methods through the use of Enquiry Based Learning, embedding careers within the curriculum, using social media and both formative and summative assessment. I have significant engagement and impact through my work with the British Ecological Society and Pearson, contributing to national debates and policy development within the educational system.

I have recently been awarded £9,000 to develop Field Based Teaching using I-Pad technology by CLAD and the College of Life and Environmental Sciences

### Postgraduate supervision

**I am happy to receive applications for PhD study within the areas of 'ecology of industrial pollution' and 'mining pollution' from self-funded students**

#### Current Students:

**Seniyat Afegbua** Phytoremediation of toxic organic pollutants from crude oil contamination in the Niger-Delta region of Nigeria. Nigerian Petroleum Development Fund

**Sarah Lynch** Establishing the environmental risk of contaminated sediments NERC

### Doctoral research

**PhD title** Metal removal processes in wetlands receiving acid mine drainage

### Research

#### Research groups

- Water Sciences
- [Hydroecology \(/research/activity/water/themes/hydroecology/index.aspx\)](/research/activity/water/themes/hydroecology/index.aspx)

#### Research interests

- Ecology of Industrial Pollution (Freshwaters and Land)

- Passive Treatment Technologies

- Phytoremediation
- Biodiversity

Current / Recent Research

*Miner-Farmer landscapes of the North Pennines Area of Outstanding Natural Beauty (AONB) Funded by English Heritage*

A collaborative project with Birmingham Archaeology

GIS-based remote-sensing and environmental research' combines a range of remote sensing techniques in order to research the application of remote datasets for the identification of moorland industrial activity and the relationship with the natural environment and erosion, including the gathering of environmental data. The aim of this project is to evaluate the past, present and future impacts of historical industrial activity on Alston Moor including the analysis of peat erosion. Specifically, this project will use a combination of remote sensing techniques and ground-truthing in order to:



- Record areas of archaeology, and particularly remains relating to industrial activity (including the impacts of industrial activity such as contamination) as identified through remote sensing techniques
- Record and assess the past, present and future impacts of historical industrial activity on the landscape, specifically in relation to contamination (identified through a combination of remote sensing techniques and soil sampling)
- Record and assess the impact of peat erosion and other erosion (especially water erosion) on the present and future preservation of the archaeological resource in relation to the future management of this landscape
- To assess the efficacy of novel remote-sensing techniques for the interpretation and management of this and similar landscapes

Hence the project is aimed at providing information towards the formulation of a management plan for the North Pennines region, and for the generation of a useful toolkit for application within similar landscapes elsewhere. These aims will be achieved through:

- The investigation of current sources of satellite data, aerial imagery and the analysis of LIDAR data for the identification of past industrial activity and its relationship to areas of peat erosion and land improvement. The survey area will cover 32 square kilometres of the Alston Moor area
- The analysis of multi- and hyper-spectral data of the same sample area as above providing a comparison of the different techniques for identification of industrial remains.
- A programme of borehole excavation and soil analyses to assess for mining debris and contamination in the sample area. The results will provide validation of non-invasive interpretations and will complement the above, providing baseline data for the application of these techniques elsewhere.

## Other activities

- Senior Tutor for GEES
- Associate Editor for Journal of Geochemical Exploration
- Chair of the Education, Training and Careers Committee for the British Ecological Society
- Fellow of the Higher Education Academy

## Publications

### Books

Cresser, M., Batty, L.C., 2013 An Integrated Introduction to Environmental Science, Pearson UK *Undergraduate Text Book*

Batty, L.C., Hallberg, K. (Eds) 2010 Ecology of Industrial Pollution: restoration, remediation and preservation. Cambridge University Press, Cambridge, UK. 350pp ISBN 978-0-521-73038-9

Harrad, S.J., Batty, L.C., Diamond, M. and Arhonditsis, G. 2008. Student projects in Environmental Science. Wiley Publishers, Chichester *Undergraduate and Postgraduate Text Book* 163pp

### Key Publications since 2011

Lynch, S., Batty, L.C., Byrne, P. 2014 Environmental risk of metal mining contaminated river bank sediment at redox-transitional zones *Minerals*, 4, 52-73

Chibuikwe, C., Batty, L.C. 2013 Phytoremediation potential of *Brassica juncea* in Cu-pyrene contaminated soil: comparing freshly spiked soil with aged soil *Journal of Environmental Management* 129, 18-24

Chibuikwe, C., Batty, L.C. 2013 Interactions of copper and pyrene on phytoremediation potential of *Brassica juncea* in copper-pyrene co-contaminated soil *Chemosphere*, 90, 2542-2548

Chibuikwe, C., Batty, L.C. 2013 Effect of combined pollution of chromium and benzo(a)pyrene on seed growth of *Lolium perenne*. *Chemosphere*, 90, 164-169

Chibuikwe, C., Batty, L.C. Effect of EDTA and citric acid on phytoremediation of Chromium-B(a) P co-contaminated soil *Environmental Science and Pollution Research* 20, 8955-8963

Batty, L.C., Dolan, C. 2013 The potential use of phytoremediation for sites with mixed organic and inorganic contamination. *Critical Reviews in Environmental Science and Technology*, 43, 1-43

Jadeja, R.N., Batty, L.C. 2013 Metal content of seaweeds in the vicinity of acid mine drainage in Amlwch, North Wales *Indian Journal of Geo-marine Sciences* 42, 16-20

Gubbins, E., Batty, L.C., Lead, J.R. 2011 Phytotoxicity of silver nanoparticles to *Lemna minor* L. *Environmental Pollution* 159, 1551-1559

