

ANDREW DAVID ROBERTSON – CURRICULUM VITAE

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EDUCATION

University of Aberdeen, UK, in association with the Centre for Ecology and Hydrology and Shell Research Ltd

2011 – 2015 **PhD Environmental Sciences:** Evaluating ecosystem carbon budget implications of *Miscanthus* used as a bioenergy crop: mechanisms controlling carbon cycling.

Objectives of the project were to address the uncertainties that surround estimates of carbon pools under *Miscanthus* plantations and to quantify the key fluxes within these pools. To achieve these deliverables, a number of experiments were set up around a field study that manipulates inputs to evaluate the effects of roots and plant litter separately. The outputs of these experiments have provided the mechanistic data required to parameterise and validate soil carbon models specific to *Miscanthus*. It is anticipated that this project's research outcomes will inform future bioenergy policy and address fundamental research questions about soil carbon cycling.

Key skills:

- Fieldwork: *soil coring; trace gas measurements; biomass sampling*
- Labwork: *physiochemical soil fractionation; isotope-ratio mass spectroscopy*
- Analytical: *statistical modelling using R; mechanistic systems modelling with ECOSSE, CENTURY, RothC, DNDC; time-series analysis with mixed models*
- Computing: *spreadsheet and database management, website design, image and video editing, efficiency with command line scripts and debugging*
- Interpersonal: *effective teamwork and project management; industry & academic network channels; mentoring through effective communication; strong audio-visual presentation skills*

University of Edinburgh, UK

2009 – 2010 **MSc Environmental Sustainability**
Thesis title: The effects of land use change on soil carbon: A study of conversion from pasture to plantation in New Zealand.

2005 – 2009 **BSc (Hons) Ecological Science (Environmental Science)**
Honours project: Modelling the changes in atmospheric carbon dioxide concentrations between Scotland and Ireland.

United World College of South East Asia (Singapore)

2002 – 2004 **International Baccalaureate**

WORK EXPERIENCE

Colorado State University (USA)

April 2015 - Present
(Full Time) **Postdoctoral research scholar - Soil and Crop Sciences**
Long-term datasets from agricultural field sites across the American Great Plains are being used to assess how a number of ecosystem scale systems models can be improved to ensure reliable simulations given various management and climate change scenarios.

Shell Global Solutions (UK)

- May 2009 – Sept 2009 (Full Time) **Researcher – Biofuels and Alternative Energy department**
A statistically rigorous meta-analysis was used to assess the impacts of land use change on soil carbon; data was mined from 310 sites to compile a comprehensive global database and determine best estimates from different land use transitions.
- May 2008 – Sept 2008 (Full Time) **Project Developer – Base Oils department**
Linked webpages within Shell's intranet were designed and built to feed from a central Access® database. Webpages used Flash® to create interactive, national-scale maps of all used oil facilities and associated local legislation within that country.
- June 2007 – Sept 2007 (Full Time) **Lubricants Analyst – Analytical department**
In addition to the responsibilities listed in 2006, I trained and managed two technicians to ensure they operated at high levels of quality and safety. ISO standards 9001 and 14001 were both achieved.
- Apr 2006 – Sept 2006 (Full Time) **Lubricants Analyst – Analytical department**
Shell receives lubricant blends and hydrocarbon samples from external companies worldwide. My responsibilities included: analysis for various physical and chemical properties including viscosity, flash point, dispersancy and metal contamination.
- Aug 2004 – Jan 2005 (Full Time) **Land Remediation Assistant – Health, Safety and Environment department**
A novel *in-situ* ecotoxicology testing kit was evaluated for Shell with a final appraisal presented to the commissioning company on behalf of Shell. Additionally, soil samples from a range of refinery sites were analysed for contamination with reports suggesting the most effective remediation presented to senior staff.

Dyne Solicitors

- May 2007 (Full Time) **Intern – Environmental Law department**
Environmental cases related to my expertise were summarised for both solicitors and barristers within the firm. I accompanied barristers to court regarding these cases.

COMMUNICATIONS

Peer-reviewed publications

In preparation

Robertson, A.D., C.A. Davies, P. Smith, *et al.* Carbon budgeting in a commercial *Miscanthus x giganteus* plantation: an LCA approach from measured inputs and outputs. *Global Change Biology Bioenergy*

Robertson, A.D., C.A. Davies, P. Smith, *et al.* Isotopic partitioning of carbon dynamics within a commercial *Miscanthus x giganteus* plantation in the UK. *Global Change Biology Bioenergy*

Published

Robertson, A.D., C.A. Davies, P. Smith, M. Dondini and N.P. McNamara. 2014. Modelling the carbon cycle of *Miscanthus* plantations: existing models and the potential for their improvement. *Global Change Biology Bioenergy*, doi: 10.1111/gcbb.12144.

Smith, P., F. Albanito, **A.D. Robertson**, *et al.* 2012. Systems approaches in global change and biogeochemistry research. *Philosophical Transactions of the Royal Society B*, **367**: 311-321.

Journal reviews for: Global Change Biology; Global Change Biology Bioenergy; Biomass and Bioenergy; Agriculture, Ecosystems and Environment; Sustainability.

Events organised

- 2014 - 2015 **Organiser and Chair** – *European Geophysical Union General Assembly*
(Session SSS6.1 / GM4.9 / HS8.3.12)
- 2013 **Organiser and Chair** – *Early Career Bioenergy Symposium*
(Whole conference)

Selected external presentations

Robertson, A.D., C.A. Davies, P. Smith and N.P. McNamara. Budgeting for the future: the ins and outs of terrestrial carbon cycling. Ecology and Conservation Seminar Series, Lancaster University, Lancaster, UK. October 31, 2014.

Robertson, A.D., C.A. Davies, P. Smith and N.P. McNamara. Land use change to *Miscanthus*: measured and modelled changes in soil carbon fractions. European Geophysical Union General Assembly, Vienna, Austria. April 30, 2014.

Robertson, A.D., C.A. Davies, P. Smith and N.P. McNamara. Using an input manipulation experiment to partition greenhouse gas fluxes from a commercial *Miscanthus* plantation in the UK. European Geophysical Union General Assembly, Vienna, Austria. April 30, 2014.

Robertson, A.D., C.A. Davies, P. Smith and N.P. McNamara. Is *Miscanthus* a good bioenergy crop option? Department meeting, Shell Technology Centre, Houston, Texas, USA. January 27, 2014.

Robertson, A.D., C.A. Davies, P. Smith, E. Clark and N.P. McNamara. Separating contributions to SOC stocks from roots and aboveground plant litter below a *Miscanthus* plantation. British Society of Soil Science Early Career Conference, York, United Kingdom. March 27, 2013.

Robertson, A.D., C.A. Davies, P. Smith, E. Clark and N.P. McNamara. Longevity of contributions to SOC stocks from roots and aboveground plant litter below a *Miscanthus* plantation. European Geophysical Union General Assembly, Vienna, Austria. April 9, 2013.

Robertson, A.D., C.A. Davies, P. Smith, E. Clark and N.P. McNamara. Partitioning belowground CO₂ emissions for a *Miscanthus* plantation in Lincolnshire, UK. European Geophysical Union General Assembly, Vienna, Austria. April 8, 2013.

Robertson, A.D., C.A. Davies, P. Smith, J.W. Finch and N.P. McNamara. Carbon budgeting of a *Miscanthus* plantation. Lancaster Environment Centre interdepartmental meeting, Lancaster University, Lancaster, United Kingdom. October 27, 2011.

Robertson, A.D. The impacts of America's Conservation Reserve Program on soil carbon. Soil Protection and Management Seminars, University of Edinburgh, Edinburgh, United Kingdom. April 15, 2010.

Personal statement

I am a keen footballer, playing in outdoor leagues from April to September and indoor leagues October to March. I enjoy organizing social events and have organized a number of sports leagues, pub quizzes and team scavenger hunts across the UK. During my time at Edinburgh I wrote the crosswords for the University newspaper and was involved in the University intramural league. Before this, I represented my schools in football, cricket, hockey and volleyball. A passion of mine is to travel and experience new places and cultures. Recently I travelled to Japan and Southeast Asia, and whenever possible I try to visit my father's side of the family, in Virginia. My experience of living and working abroad within different cultural backgrounds has been of great benefit to me and I feel I have developed the key interpersonal skills required to work effectively within a diverse mix of team players.