



## **Soil carbon stocks in Scotland: past changes and future conservation needs.**

**J. Bellarby** (1), P. Gottschalk (1), S. J. Chapman (2), A. Lilly (2), J. S. Bell (2), W. Towers (2), D. Miller (2), G. Hudson (2), P. Smith (1), J. U. Smith (1)

(1) University of Aberdeen, United Kingdom, (2) Macaulay Institute, United Kingdom

Due to the extent of peat in Scotland, and its high carbon content of these soils, it is a very important component of Scotland's carbon budget. As shown for England and Wales (Bellamy et al, 2005), any changes in the soil carbon content would have a significant impact on the carbon budget of Scotland and the UK as a whole. This study uses 1 km resolution data on soil C concentration, soil wetness class and soil pH derived from the national Scottish Soils Database (held by the Macaulay Institute). These data form the input to the ECOSSE model (Estimating Carbon of Organic Soils, Sequestration and Emission, Smith et al, 2007) in order to simulate greenhouse gas emissions from Scottish soils and to address policy questions associated with specific scenarios of changes in land use and climate. Scenarios of land use change draw on historical data, predictions of the future (Rounsevell et al., 2005) and options for climate change mitigation. Climate scenarios include historical changes in climate and future predictions derived from the HadCM3 climate model, used to implement four IPCC emission scenarios. The results of the national simulations will be presented, and potential measures to reduce greenhouse gas emissions from peatlands discussed.

Bellarby PH, Loveland PJ, Bradley RI et al. GJD (2005) Nature, 437, 245-248.

Rounsevell MDA, Ewert F, Reginster I et al. (2005), Agriculture, Ecosystems and Environment, 107, 117-135.

Smith P, Smith JU, Flynn H et al. (2007) Final Report. SEERAD Report. ISBN 978 0 7559 1498 2. 166pp.