For centuries, peatlands in the UK were perceived as unproductive wastelands, where burning and draining to increase productivity was common practice.

More radical land-use change was initiated in the 1950s due to post-war timber shortages, and around a fifth of all our peatlands were covered in coniferous plantations by the 1980s. The Flow Country Peatlands of Caithness and Sutherland, the largest expanse of blanket bog in Europe, was heavily damaged and fragmented.

Peatlands are the most efficient terrestrial carbon store in the world: the Flow Country peatlands alone hold about 400 metric tonnes of carbon – roughly three times as much as in all of the UK's forests. The peat itself, accumulated over the last 10,000 years, is an invaluable ecological, climatological and archaeological archive. In addition, healthy peatlands regulate water run-off and can contribute to flood mitigation. The conditions that prevail in these landscapes – constantly waterlogged, nutrient poor – also mean they support unique, often highly specialised biodiversity.

Putting the Flow Country peatlands on the map

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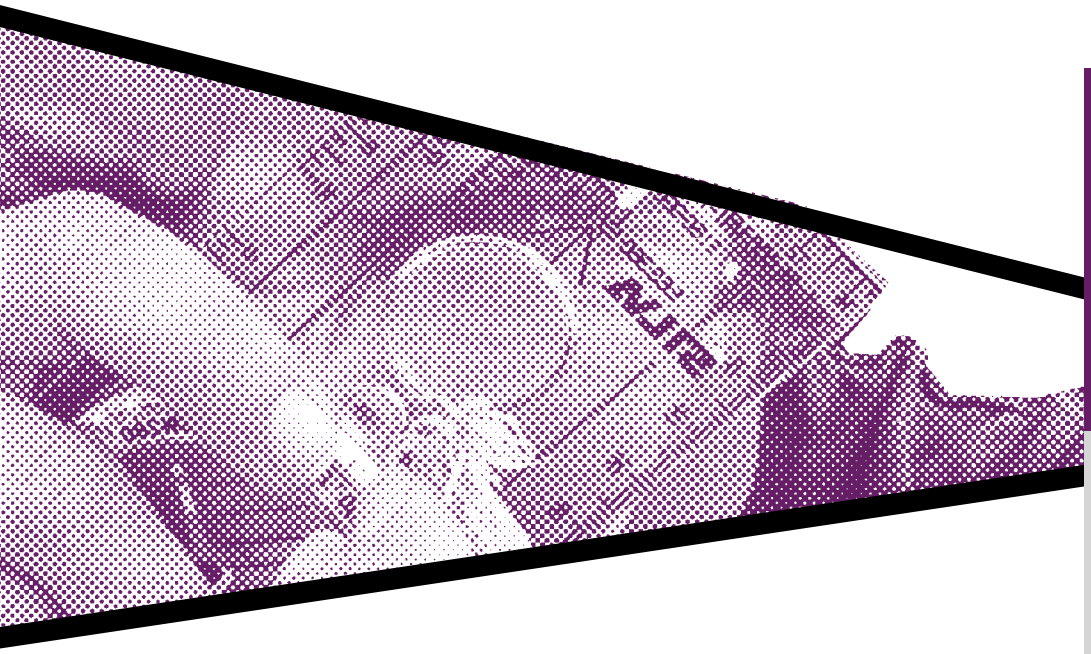

Dr Roxane Andersen, PhD

Dr Roxane Andersen is a senior research fellow at the university's Environmental Research Institute.

She leads the institute's Water, Carbon and Climate research theme and coordinates the Flow Country Research Hub. She is vice-chair of the Commission on Restoration for the International Peatland Society and has recently been appointed to Scotland's National Peatland Research and Monitoring Group.

Originally from Canada, Dr Andersen completed her PhD in 2009 and came to Scotland to work as a post-doctoral research fellow with the James Hutton Institute, where she investigated how peatland microbial processes were affected by contamination from Oil Sands processed water.

She also contributed to a review commissioned by Scottish National Heritage on the potential benefits of blanket bog restoration in Scotland, published in 2014. Dr Andersen was appointed to the Environmental Research Institute in 2012, to lead and develop our peatland research programme.

Her current research focusses on evaluating the recovery of above and belowground processes and diversity in restored systems. In Scotland, she works in the Flow Country Peatlands and on the cliffs surrounding the Dounreay nuclear power plant. She is also part of a Canadian team leading cutting-edge research on peatland reclamation in the Oil Sands region of Alberta. She has published in many international journals, and contributed to several book chapters.

In 2015, she co-organised a symposium on Global Peatland Restoration for the Society of Ecological Restoration's world conference in Manchester, and organised and hosted the 3rd Flow Country Research Conference in Thurso. She is currently collaborating with National Geographic on a feature article and film on Scottish Moors.

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However disturbed peatlands lose their ability to perform all these functions, which bears a significant cost to society. In the last decade, it has been shown that this cost could be alleviated by appropriate restoration. Yet sound science is needed to support and inform policy development related to the sustainable use of peatlands, their management and restoration.

In 2012, the university's Environmental Research Institute, the Centre for Ecology and Hydrology and the Royal Society for the Protection of Birds (RSPB) initiated an ambitious plan to address this. Dr Roxane Andersen was appointed to coordinate a new collaborative network of researchers and stakeholders which aimed to establish the Flow Country as a UK focal point of contemporary peatland science: the Flow Country Research Hub.

The institute organised and hosted three research conferences, and began to produce a quarterly newsletter. It also contributed to Flows to the Future, a £4 million project led by the Peatlands Partnership and funded by Heritage Lottery Funds. The project supports peatland restoration and the construction of infrastructures at the RSPB's Forsinard Flows reserve.

In the last two years, Dr Andersen and the institute's peatland teams have taken part in 15 multi-partner research and consultancy projects, evaluating changes in carbon stocks, greenhouse gas emissions, water quality and biodiversity following restoration. The hub concept and activities have been presented locally, nationally and internationally as a model of collaborative research integrating the interests of a diverse range of stakeholders.

Over the same period, the Flow Country peatlands have been included in three global research initiatives led by scientists in the USA, Germany and Sweden. World leaders in peatland ecology and restoration have visited from Canada, Finland and Germany.

The Flow Country peatlands are no longer perceived as 'remote' and 'barren': the northern tip of Scotland is becoming a globally strategic peatland research location.

The peat itself, accumulated over the last 10,000 years, is an invaluable ecological, climatological and archaeological archive.