

**Dr Susan E Lee** B.Sc., M.Sc., Ph.D.

Research Fellow

School of Civil Engineering

## Contact details

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## About

Dr Susan Lee is a Research Fellow on the Liveable Cities Project funded by the EPSRC.

Susan has published in a variety of journals including a paper in Nature on climate and vegetation modelling feedbacks in 1997. She has worked within a number of disciplines ranging from Architecture, Arctic Ecology, Agriculture, Global Ecology and Meteorology to Environmental Sciences and Engineering.

Susan's research interests are varied, and range from the micro- to the macro-scale effects of both weather and climate on buildings and their occupants as well as vegetation. She is particularly interested in the environmental impact of climate change particularly how this affects the urban environment as well as the natural world.

## Qualifications

- Ph.D in climate and vegetation modelling, University of Sheffield, 1998.
- M.Sc. in Agricultural Meteorology, University of Reading, 1987.
- BSc (Sp. Hons) Geography, University of Sheffield, 1984
- Fellow of the Royal Meteorological Society
- Associate Fellow of the Remote Sensing and Photogrammetry Society

## Biography

Susan joined the School in January 2013. She previously worked at Leeds, Manchester and Sheffield Universities on a number of research projects, most recently the NERC-funded Microclimates Project at Leeds. This project investigated the impact of spatio-climatic variability on land-based renewable energy sources such as wind power and bio-energy crops. Previously she worked on the SCORCHIO Project (2007-2010) funded by the EPSRC (Engineering and Physical Sciences Research Council) at both Manchester and Sheffield Universities.

This project was concerned with the impact of climate change on the built environment. Prior to this work, Susan spent eight years modelling climate and vegetation at the global and the regional scale (Arctic) at Sheffield University. She has also spent time in the Nordic countries and has modelled arctic vegetation. In addition, she has produced a paper on the impact of a changing climate on the Saami reindeer herders of northern Finland.

During the late 1980's Susan worked as a weather forecaster for the UK Meteorological Office. She presented radio broadcasts and supplied weather data for the general public, aviation and the local press in North-West England.

## Teaching

I do not have any current teaching responsibilities within the School. However, I am a part-time tutor for the Centre for Continuing Education at the University of Manchester and I have run evening classes in Meteorology and Climate Change for mature students.

## Research

### Current research project:

#### Liveable Cities

A £6 million 5-year research EPSRC-funded programme to identify and test radical engineering solutions that will lead to low carbon, resource secure future cities in which societal well-being is prioritised. Our objectives are:

- To understand how cities operate and perform in terms of their people, environment and governance.
- To establish how city performance relates to the vision of low-carbon living, working, conserving and consuming
- To develop realistic and radical engineering solutions, and test them as interventions in case studies.

Susan's current research includes data mapping of the material and energy flows of Birmingham. This will be followed by further case study research on the cities of Southampton and Lancaster. The Liveable Cities research will focus on developing a future city with zero waste, 80% carbon reduction and with a high well-being for its citizens. A number of pathways will be proposed to achieve this future.

### Previous research projects:

#### Microclimates

A NERC-funded project set up to investigate the impact of spatio-climatic variability on land-based renewable energy sources such as wind power and bio-energy crops. - <http://ncasweb.leeds.ac.uk/microclimates/> (<http://ncasweb.leeds.ac.uk/microclimates/>)

[http://www.see.leeds.ac.uk/news/news-inner/?tx\\_ttnews%5Btt\\_news%5D=154&cHash=ceeca10438292f6dea7129ee428dfc20](http://www.see.leeds.ac.uk/news/news-inner/?tx_ttnews%5Btt_news%5D=154&cHash=ceeca10438292f6dea7129ee428dfc20)  
([http://www.see.leeds.ac.uk/news/news-inner/?tx\\_ttnews%5Btt\\_news%5D=154&cHash=ceeca10438292f6dea7129ee428dfc20](http://www.see.leeds.ac.uk/news/news-inner/?tx_ttnews%5Btt_news%5D=154&cHash=ceeca10438292f6dea7129ee428dfc20))  
- <http://www.youtube.com/watch?v=SPE3-1xoOSI> (<http://www.youtube.com/watch?v=SPE3-1xoOSI>)

## SCORCHIO

(Sustainable Cities: Options for Responding to Climate cHange Impacts and Outcomes) project funded by EPSRC (Engineering and Physical Sciences Research Council) (Spring 2007 to Autumn 2010). A GIS based tool was developed using the latest forecasts from the UK Climate Impacts Programme UKCIP to assist planners, designers, engineers and users to adapt urban areas, with a particular emphasis on heat and human comfort. This included work on identifying the urban heat island of Manchester and the use of building simulation models to identify internal temperatures and thermal comfort within residential buildings. The Universities of Manchester, East Anglia, Newcastle and Sheffield with the Hadley Centre, Met Office were all involved in this work. <http://www.sed.manchester.ac.uk/research/cure/research/scorchio/>  
(<http://www.sed.manchester.ac.uk/research/cure/research/scorchio/>)

## BASIS

(Barents Sea Impact Study) project (1997 to 2000) was carried out by an interdisciplinary team of specialists from 13 institutions in 6 countries funded by the European Commission. This led onto the BALANCE project.  
See: Lange, M. and the BASIS consortium (2003): "The Barents Sea Impact Study (BASIS): methodology and first results", Continental Shelf Research, 23: 1673-1694  
<http://www.ingentaconnect.com/content/els/02784343/2003/00000023/00000017/art00149>  
(<http://www.ingentaconnect.com/content/els/02784343/2003/00000023/00000017/art00149>)  
<http://balance1.uni-muenster.de/> (<http://balance1.uni-muenster.de/>)

Susan presented papers at a number of conferences in Europe and the Nordic Countries, as well as the USA, related to vegetation modelling. She was a Joint organiser of the IRISEN (Integrated Regional Impact Studies in the European North) study course at the Abisko Research Station in Sweden (July 1999). Twenty-five students from 13 countries joined more than twenty experts to explore the issue of integrated regional impact studies in an interdisciplinary manner.

## TIGER IV

(Terrestrial Initiative in Global Environmental Research) Programme (1992 – 1997) funded by NERC (Natural Environment Research Council). See the following for details about some of this work: <http://www.ceh.ac.uk/products/publications/documents/23global2.pdf> (<http://www.ceh.ac.uk/products/publications/documents/23global2.pdf>)  
. Development of vegetation models, Dynamic glObal phtogeographY (DOLY) and the Sheffield Dynamic Global Vegetation Model (SDGVM).  
<http://www.ctcd.group.shef.ac.uk/science/vegmodels/part2.html> (<http://www.ctcd.group.shef.ac.uk/science/vegmodels/part2.html>).

## Other work:

Investigating the Lappish climate in northern Finland (1997). This work was concerned with the influence of climate on the vegetation and reindeer of northern Finland, and the possible effects of climate change on the Saami people (Lapps). Climate data were analysed involving collaborative work with colleagues from the Department of Social Anthropology at the University of Manchester. This project was funded by the ESRC.

Arctic Centre, Rovaniemi, Finland. [http://www.arcticcentre.org/InEnglish/RESEARCH/Arctic\\_research\\_in\\_Finland.iw3](http://www.arcticcentre.org/InEnglish/RESEARCH/Arctic_research_in_Finland.iw3)

Weather forecasting for the UKMO at Manchester Weather Centre (1990-1992); Agricultural Meteorologist and Adviser in the public services and building and construction climatology unit at the UKMO (1987-1990)

## Publications

Lee, S.E. & Levermore, G. (2013) Simulating urban heat island effects with climate change on a Manchester house. Building Services Engineering Research and Technology, 34 (2) pp.203-221.

Claire L Smith, Sarah J Lindley, Geoff J Levermore, Susan E Lee. "A GIS-based decision support tool for urban climate risk analysis and exploration of adaptation options, with respect to urban thermal environments" The seventh International Conference on Urban Climate, 29 June - 3 July 2009, Yokohama, Japan.

Lee, SE; Sharples, S (2008) An analysis of the Urban Heat Island of Sheffield – the impact of a changing climate, Proceedings of PLEA 2008, 25th International Conference on Passive and Low Energy Architecture, Dublin, 22-24 October 2008. Sharples, S; Lee, SE (2008) Climate Change and Building Design in Sustainable Building Engineering.

Lee, SE ; Press, MC; Lee, JA; Ingold, T; Kurttila, T (2000) Regional effects of climate change on reindeer – a case study of the Muotkatunturi region in Finnish Lapland, Polar Research, 19, pp. 99–105.

Lee, SE; Press, MC; Lee, JA. (2000) Observed climate variations during the last 100 years in Lapland ; northern Finland, International Journal of Climatology, 20, pp. 329–346.

Woodward, FI, Lomas, MR & Lee, SE (1999) Predicting the future production and distribution of global terrestrial vegetation. In, Terrestrial Global Productivity Roy, J; Saugier, B; Mooney, H (eds.) Academic Press.

Callaghan, TV , Körner, Ch , Heal, OW , Lee, SE , Cornelissen, JHC (1999) Global change in Europe's cold regions: Scenarios for ecosystem responses to global change. In, Global changes and the Barents Sea Region: Proceedings of the First International BASIS Research conference, St. Petersburg, Russia Feb 22–25, 1998, (ed. Lange, MA; Bartling, B; Grosfeld, K) pp.17–50. Institute for Geophysics, University of Münster, Corrensstrasse 24, D-48149, Münster, Münster.

Global Change in Europe's Cold Regions 1998, (eds. Heal OW; Callaghan, T V; Cornelissen, JHC; Körner, Ch & Lee S E ). Ecosystems Research Report 27 European Commission, Office for Official Publications of the European Communities, Luxembourg, Brussels.

Betts, RA; Cox, PM; Lee, SE; & Woodward, FI (1997) Contrasting physiological and structural vegetation feedbacks in climate change simulations. Nature, 387, pp. 796–799. Woodward, FI; Lee, SE (1995) Global scale forest function and distribution. Forestry 68, pp. 317–325.

Woodward, FI; Lee, SE (1994) Modelling terrestrial vegetation, The Globe 21, pp. 5–6.