

**Susan Margaret Owen**  
**(B.Sc, BSc (Hons), M.Sc, PhD)**

**Personal details**

Nationality	British
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**Overview of current employment and interests**

- Date and Band of first appointment to NERC CEH Edinburgh: 27/08/07 at Band 6.
- Currently employed at Band 6
- Highest educational qualifications: PhD
- Development activities undertaken:

19/03/08 – 20/03/08	Emergency First Aid for Tropical Expeditions
08/04/08 – 10/04/08	Managing projects
01/06/08 – present	IGOR software ("on the job")
07/10/08 – 08/10/08	Communicating Science to the public

- Main roles undertaken during NERC career:

Team-leading researcher for biogenic volatile organic compounds  
Chair of NitroEurope Data Management Committee  
Data Centre and Component 1 Data Manager for NitroEurope  
School Liaison Officer CEH Edinburgh

I am interested in the emissions of volatile organic compounds (VOCs) from vegetation, soil and other natural sources, and their contribution to atmospheric chemistry and air quality. I am also interested in the physiological, ecological and environmental controlling factors of emissions, and interactions between climate change variables and regional VOC emission estimates. I have experience of modelling the effect of biogenic VOC emissions on air quality, and of classifying urban land for emission inventory purposes. I have also collaborated with soil microbiologists to investigate the role of biogenic VOCs as co-metabolites for persistent pollutants in soils. I am currently seeking funding to investigate the effect of VOCs in rhizosphere and soil surfaces on greenhouse gas flux from natural and managed ecosystems. Within the last year I co-authored three papers, allowing PhD students to take first authorship.

I chair the Data Management Committee for the NitroEurope Integrated Project and keep a broad overview of data management activities associated with the field measurements, the experimental measurements, the modelling and the up-scaling. I am a Data Centre Manager for NitroEurope taking a leading role in development, use and maintenance of the large and complex database for Components 1-3.

I am active as school liaison officer, having hosted and supervised a Nuffield project student for 6 weeks during summer 2008, and hosted and supervised 3 school students during work experience weeks.

**Overview of experience and skills**

- 15 years of research experience in plant volatile isoprenoids, previously at the Institute of Environmental and Natural Sciences, Lancaster University, the Centre de Recerca Ecològica i Aplicacions Forestals, Universitat Autònoma de Barcelona and at CEH, Edinburgh.
- 32 publications in high impact journals (and 7 in preparation). World-wide contacts and collaborators. Success in attracting research funding. H-index=12.
- A wide range of research, managerial, communications, computing and modelling skills in the fields of atmospheric chemistry, plant physiology and ecology.

- Technical expertise and experience with GC-MS. Limited experience with PTR-MS. Some experience of Fortran programming in a Lagrangian model for chemistry and transport of pollutants in the atmosphere. Some experience with GIS.
- Experience of supervising students and small research teams, and organising and executing field-work in the UK and abroad in European and tropical locations (Appendix 1).

## Education

<b>1994 – 1998</b>	Lancaster University, PhD in Environmental Science: <b>Thesis:</b> <i>"Emissions of isoprene and monoterpenes from native Mediterranean vegetation"</i>
<b>1991 - 1992</b>	Lancaster University, MSc in Environmental and Ecological Sciences
<b>1974 - 1978</b>	Hatfield Polytechnic (now the University of Hertfordshire) (part time), BSc in Applied Biology (2.1)
<b>1969 - 1972</b>	Reading University, BSc in Maths

## Current position

**Aug 2007-present**                      **Environmental Scientist/Data Manager NitroEurope,**  
CEH Edinburgh.

- Chair of NitroEurope IP Data Management Committee. I sustain an overview of Data Management activities for the entire project.
- Data Centre manager for Components 1 - 3 of NitroEurope IP. I am taking a leading role in the development, use and maintenance of the very large and complex database stores data and allows easy reporting access for scientists.
- Data Manager for Component 1 of the NitroEurope Integrated Project. I manage data collection and verification for all the activities within this component.
- Collaboration with OP3 project (British, American, Malaysian and Spanish collaborators) and supervising PhD student in Malaysia, to continue investigating biogenic volatile isoprenoids in natural and plantation forest canopies in SE Asia.
- Research on volatile isoprenoids as carbon based defence strategies, in collaboration with the University of Malaysia in Sabah.
- Research on volatile isoprenoids in the rhizosphere, and their role in nitrogen cycling, in collaboration with The University Autònoma of Barcelona, and Lancaster University.
- Publishing research, and writing project reports.
- Schools Liaison Officer.

## Previous positions

**Sept 2004 – Aug 2007**                      **Marie Curie Training Network Research Fellow,**  
CREAF, Barcelona, Spain, with Professor Josep Penuelas.

- Evaluating effect of volatile isoprenoid emissions on air quality in SE Asia
- Quantifying the control of volatile isoprenoid emissions via requirement and synthesis of essential isoprenoids in laboratory and field experiments
- Quantifying and characterizing volatile isoprenoids in the rhizosphere of pine trees
- Publishing research, and writing project reports
- Supervising PhD and MSc students, devising projects, motivating students to publish their research

- Collaboration with European researchers; continuing collaboration with Chinese researchers

**July 2001 – June 2004                      Research Fellow**

Lancaster University, UK

*Quantifying natural volatile organic compound (VOC) emissions from a variety of tropical forest canopies in Borneo, and investigating environmental controls for these fluxes.*

- Quantified and characterised emissions of volatile isoprenoids and their environmental control in laboratory experiments and in field conditions in Borneo and tropical China
- Characterised the effect of individual environmental parameters on volatile isoprenoid emissions from selected tropical species in laboratory experiments
- For the first time, produced quantitative estimate (with uncertainty analysis) of volatile isoprenoid fluxes from tropical canopies in SE Asia
- Contributed to further modules of a Lagrangian model of tropospheric chemistry and transport (“CiTTYCaT”, coded in FORTRAN);
- Quantified the effect of volatile isoprenoid fluxes on ozone and particle formation downwind of emissions from tropical canopies in SE Asia, using the CiTTYCaT model.
- Collaborated with soil microbiologists to investigate biogenic volatile isoprenoids as co-metabolites for persistent pollutants in soils
- Collaborated with several overseas scientists, organising field work
- Supervised PhD students, devising and advising projects
- Successful bids for additional funding to finance additional projects and collaborations

**Jan 1999 – Jul 2001**

**Postdoctoral Research Associate**

Lancaster University, UK, with Professor Nick Hewitt

- Responsible for the co-ordination and execution of Lancaster’s NERC funded URGENT project “Urban Tree Planting as an aid to Air Pollution Abatement: the West Midlands Case”. This was a user-community driven project, with frequent meetings and discussions with the seven West Midland Metropolitan Borough Councils.
- Achievements included: developing an urban land use classification to facilitate mapping urban vegetation; estimating VOCs emitted by trees; modelling O<sub>3</sub> and aerosol formation; contributing to the conceptualisation and implementation of an Urban Tree Air Quality Score (UTAQS).
- Research tools: Microsoft ACCESS database; GIS; atmospheric chemical model (FORTRAN)

**Jan 1998 – Dec 1998**

**Postdoctoral research associate (part time)**

Lancaster University, UK, with Professor Nick Hewitt

- Responsible for the initial management of two EU projects “New Particle Formation and Fate in the Coastal Environment” (PARFORCE) and “Parameterisation of Environmental and Physiological Controls of VOC Emissions from European Forests” (ECOVOC).

**Mar 1994 – Nov 1998**

**PhD student**

Lancaster University, UK, with Professor Nick Hewitt

- Quantified and characterised emissions of monoterpenes and isoprene from Mediterranean plant species as the contribution from Lancaster University to the multinational European project “Biogenic Emissions in the Mediterranean Area” (BEMA). Responsible for participation in major field campaigns in Italy, France and Spain.
- Successfully participated in multinational inter-comparison experiments to compare sampling and analytical techniques of the different BEMA laboratories.
- Collaborated with the University of Ljubljana, to investigate loss to the sampling system of compounds normally present in plant emissions.

- Quantified the light dependency of monoterpene emissions in experimental work at the National Center for Atmospheric Research (NCAR), at Boulder, Colorado.

**May 1989 - Mar 1994**

**Various part-time positions**

including lecturing at Lancaster and Morecambe College F.E., and factory and clerical work.

**Jun 1988 - May 1989**

**Freelance Database Programmer/Analyst**

MAFF (now DEFRA) Laboratories, Hatching Green, Harpenden, Herts.

- Using a SUN workstation and software INFORMIX under UNIX, I successfully converted several MAFF licensing databases to an upgraded version of INFORMIX.
- Produced user-friendly documentation

**Apr 1983 - Dec 1988**

**Programmer/Analyst (Medical Applications)**

SmithKline Beecham (now GlaxoSmithKline), Welwyn Garden City, Herts.

- Developed and maintained databases for the processing of clinical trials and adverse drugs reactions data, using Fourth generation hierarchical database program RAMIS.
- Liaised with members of the Medical and Statistics departments to provide output to user-defined specifications.
- Responsible for preparing technical documentation and for training colleagues.
- Proficient at trouble-shooting.

**Periods not accounted for above were devoted to my young family.**

## **Research Income**

I have helped to generate funding worth > £325,000 for several research projects while working with Professor Hewitt at Lancaster University. Sponsors include the Natural Environment Research Council, the European Union, the British Council, the Lancaster University Research Committee, the Royal Society and the British Ecological Society.

## **Student projects devised and supervised**

9 post-graduate student dissertations/theses supervised, most to distinction level (Appendix 2)

## **Courses taught**

2002 – 2005      Contributed to masters' course on the interaction between pollutants and plants  
2001 – 2004      Contributed to introductory masters' course on analytical chemistry

## **Positions of responsibility**

2000 – 2004      Volunteer College Tutor for Pendle College, Lancaster University  
2002 – 2004      Member of UK NERC Peer Review College  
2002 – 2005      Organised Department Seminars for Environmental Science, Lancaster University  
2004 – 2005      Member of the Undergraduate Admissions Team for Environmental Science Dept, Lancaster University  
2007 – 2008      CEH Edinburgh Schools Liaison Officer

## **Additional information**

My leisure time is spent mostly with family and friends, exploring, hiking, cycling, and music (classical and folk). I enjoy modern languages, and I'm trying to keep post-GCSE French and German active. After living for 2 years in Catalonia, I continue to learn Catalan to sustain friendships with Catalan people. I hold a current clean driving licence.

## **Referees**

Professor Josep Peñuelas      [josep.penuelas@uab.cat](mailto:josep.penuelas@uab.cat)  
Professor Nick Hewitt      [n.hewitt@lancaster.ac.uk](mailto:n.hewitt@lancaster.ac.uk)  
Dr Kirk Semple      [k.semple@lancaster.ac.uk](mailto:k.semple@lancaster.ac.uk)  
Dr Rob MacKenzie      [r.mackenzie@lancaster.ac.uk](mailto:r.mackenzie@lancaster.ac.uk)

## Publications

### **Peer-reviewed**

Porcar-Castell A, Peñuelas J, **Owen SM**, Llusà J, Munné-Bosch S, and Bäck J. Leaf carotenoid concentrations and monoterpene emission capacity under acclimation of the light reactions of photosynthesis, Accepted by Boreal Environment Research, 2009

Nemitz E, Dorsey JR, Flynn MJ, Gallagher MW, Hensen A, Erisman JW, **Owen SM**, Dämmgen U, and Sutton MA. Aerosol fluxes and particle growth above managed grassland, Biogeosciences Discuss., 6, 341-389, 2009

McCloughlin E, **Owen SM**, Rhodes A and Semple K. Investigating biogenic volatile organic compounds as a potential stimulator for pollutant degradation by soil microorganisms. Environmental Pollution, 157, 86–94, 2009.

Asensio D, **Owen SM**, Llusà J, Peñuelas J. The distribution of volatile isoprenoids in the soil horizons around Pinus halepensis trees. Soil Biology and Biochemistry, 40(12) 2937-2947, 2008.

Wang YF, **Owen SM**, Li QJ and Penuelas J. Monoterpene emissions from rubber trees (Hevea brasiliensis) in a changing landscape and climate: Chemical speciation and environmental control. Global Change Biology 13(11) 2270-2282. 2007

Rhodes AH, **Owen SM**, Semple KT. (2007) Biodegradation of 2,4-DCP in the presence of volatile organic compounds in soils under different vegetation types. FEMS Microbiology letters 269 (2) 323-330, 2007

Akira Tani, Shungo Kato, Yoshizumi Kajii, Michael Wilkinson, **Sue Owen**, Nick Hewitt, A proton transfer reaction mass spectrometry based system for determining plant uptake of volatile organic compounds. Atmospheric Environment 41 (8) 1736-1746, 2007

**Owen SM**, Clarke S, CN Hewitt, K Semple, Biogenic volatile organic compounds as potential carbon sources for soil microflora in soil from the rhizosphere of Populus tremula. FEMS Microbiology Letters 268, 34-39, 2007

Lin C, **Owen SM** and Penuelas J. Volatile organic compounds in the roots and rhizosphere of Pinus spp.. Soil Biology and Biochemistry 39(4) 951-960, 2007

**Owen SM**, AR MacKenzie, RGH Bunce, HE Stewart, RG Donovan, G Stark and CN Hewitt, Urban land classification and its uncertainties using principal component and cluster analyses: A case study for the UK West Midlands. Landscape and Urban Planning. 78(4), 311-321, 2006

Wilkinson MJ, **Owen SM**, Possell M, Hartwell J, Gould P, Hall A, Vickers C and Hewitt CN Circadian control of isoprene emissions from oil palm (Elaeis guineensis). The Plant Journal. 47, 960-968, 2006

**Owen SM** and J Penuelas. Plant volatile isoprenoids and their opportunistic functions: Response to Pichersky, Sharkey and Gershenzon. Trends in Plant Science 11(9), 423, 2006

**Owen SM** and J Penuelas. Volatile isoprenoids, a special case of secondary metabolism: Response to Firn and Jones. Trends in Plant Science, 11(3), 113-114, 2006.

Geron C, **Owen S**, Guenther A, Greenberg J, Rasmussen R, Bai JH, Li QJ and Baker B. Volatile organic compounds from vegetation in southern Yunnan Province, China: Emission rates and some potential regional implications. Atmospheric Environment, 40, 1759-1773, 2006.

**Owen SM** and J Penuelas, Opportunistic emissions of isoprene and monoterpenes. Trends in Plant Science 10(9), 420 – 426, 2005.

Donovan RG, AR MacKenzie, HE Stewart, **SM Owen**, and CN Hewitt, Developing an urban tree air quality score (UTAQS). *Environmental Science and Technology*, 39 (17), 6730 – 6738, 2005.

Emmerson KM, MacKenzie AR, **Owen SM**, Evans MJ, and Shallcross DE, A Lagrangian model with simple primary and secondary aerosol scheme 1: comparison with UK PM<sub>10</sub> data, *Atmospheric Chemistry and Physics*, 4, 2161-2170, 2004.  
[http://www.copernicus.org/EGU/acp/acpd/4/3127/acpd-4-3127\\_p.pdf](http://www.copernicus.org/EGU/acp/acpd/4/3127/acpd-4-3127_p.pdf)

Hayward S, A Tani, **SM Owen** and CN Hewitt, On-line analysis of volatile organic compound emissions from Sitka Spruce (*Picea sitchensis*), *Tree Physiology*, 24, 721-728, 2004.

Greenberg, JP. A Guenther, P Harley, P. L Otter, EM Veenendaal, CN Hewitt, AE James, **SM Owen**, Eddy flux and leaf-level measurements of biogenic VOC emissions from mopane woodland of Botswana, *J. Geophys. Res.* 108 (D13), art. no. 8466, 2003.

**Owen SM**, MacKenzie AR, Stewart H, Donovan R, Hewitt CN, Biogenic volatile organic compound flux from the UK West Midlands urban tree canopy, *Ecological Applications* 13 (4), 927-938, 2003.

**Owen SM**, P Harley, AB Guenther and CN Hewitt, Light dependent emissions of monoterpenes from selected Mediterranean plant species, *Atmospheric Environment*, 36 (19), 3147-3159, 2002.

Hayward, S, CN Hewitt, JH Sartin and **SM Owen**, Performance characteristics and applications of a proton transfer reaction-mass spectrometer for measuring volatile organic compounds, *Environmental Science and Technology*, 36 (7), 1554-1560, 2002

**Owen SM**, C Boissard, CN Hewitt, Volatile organic compounds emitted from 40 Mediterranean plant species, *Atmospheric Environment*, 35, 5393-5409, 2001.

J Sartin, CJ Halsall, B Davison, **S Owen** and CN Hewitt, Determination of biogenic volatile organic compounds (C-8-C-16) in the coastal atmosphere at Mace Head, Ireland, *Analytica Chimica Acta* 428 (1), 61-72, 2001

**Owen SM** and CN Hewitt, Extrapolating branch enclosure measurements to estimates of regional scale biogenic VOC fluxes in the north-western Mediterranean basin, *Journal of Geophysical Research*, 105 (D9), 11573-11583, 2000.

Gallagher MW, R Clayborough, KM Beswick, CN Hewitt, **S Owen**, J Moncrieff, K Pilegaard, Assessment of a relaxed eddy accumulation for measurements of fluxes of biogenic volatile organic compounds: study over arable crops and a mature beech forest, *Atmospheric Environment* 34 (18) 2887-2899, 2000.

Pompe M, **SM Owen**, CN Hewitt, H Basa, M Veber, Development of a calibration system for evaluation of losses in a branch enclosure sample system, *Journal of Environmental Monitoring*, 2 (2) 133-138, 2000.

Simpson D, W Winiwarter, G Borjesson, S Cinderby, A Ferreira, A Guenther, CN Hewitt, R Janson, MAK Khalil, **S Owen**, TE Pierce, H Puxbaum, M Shearer, R Steinbrecher, BH Svennson, L Tarrason, and MG Oquist, Inventorying emissions from nature in Europe, *Journal of Geophysical Research*, 104 (D7) 8113-8152, 1999.

**Owen SM**, C Boissard, B Hagenlocher, CN Hewitt, Field studies of isoprene emissions from vegetation in the Northwest Mediterranean region, *Journal of Geophysical Research*, 103, (D19) 25499-25511, 1998.

**Owen S**, C Boissard, R Street, SC Duckham, O Csiky and CN Hewitt, The BEMA Project: Screening of 18 Mediterranean plant species for volatile organic compound emissions, *Atmospheric Environment*, 31 (S1), 101-118, 1997.

Street RA, **S Owen**, SC Duckham, C Boissard and CN Hewitt, The BEMA Project: Effect of habitat and age on variations in emissions from *Quercus ilex* and *Pinus pinea*, *Atmospheric Environment*, 31 (S1), 89-100, 1997.

Larsen B, T Bomboi-Mingarro, E Brancaleoni, A Calogirou, A Cecinato, C Coeur, I Chatzianestis, M Duane, M Frattoni, J-L Fugit, U Hansen, V Jacob, N Mimikos, T Hoffman, **S Owen**, R Perez-Pastor, A Reichmann, G Seufert, M Staudt, S Tranos, The BEMA project: Sampling and analysis of terpenes in air: an interlaboratory comparison, *Atmospheric Environment*, 31 (S1), 35-49, 1997.

#### **Submitted**

Peñuelas J, Sardans J, Llusia J, Owen S, Carnicer J, Giambelluca TW, Rezende E, Waite M, Niinemets U, Faster returns on 'leaf economics', greater nutrient capture and reduced climate sensitivity in invasive plant species, submitted to PNAS, April 2003

#### **In preparation**

**Owen SM**, Wilkinson, MJ, Ryan A, Linatoc A, Sinun W, Yap S-W and Hewitt CN Isoprene and monoterpene emissions from tropical canopies in SE Asia.

**Owen SM**, Wilkinson MJ, Ryan A, Linatoc A, Hewitt CN. Variability in isoprene emission rate from oil palm.

Misztal PK, **Owen SM**, Guenther A, Geron C, Rasmussen R, Ryan A, Nemitz E, and Cape JN **Methyl chavicol fluxes from oil palms in Borneo**

Hewitt N, MacKenzie AR, Di Carlo P, Dorsey JR, Evans M, Fowler D, Gallagher MW, Hopkins JR, Jones CE, Langford B, Lee JD, Lewis AC, Lim SF, di Marco C, Misztal P, Moller SJ, Monks PS, Nemitz E, Oram DE, **Owen SM**, Phillips G, Pugh T, Pyle JA, Reeves CE, Ryder J, Siong J, Skiba U, Stewart DJ. Nitrogen management can prevent tropical oil palm plantations from causing ozone pollution.

**Owen SM** and Peñuelas J. The neglected kingdom of isoprene emitters. For submission to *Environment International*, 2009

**Owen SM and MacKenzie AR**, Estimating the concentrations of emitted compounds from an area source to establish the horizontal scale in the context of assumptions of instantaneous vertical mixing.

**Owen SM** and J Peñuelas. The relationship between volatile isoprenoid emission potentials and carotenoid concentrations in five plant species.

**Owen SM**, AE James, JC Theobald, WJ Davies, CN Hewitt and J Peñuelas. The relationship between emissions of volatile isoprenoids and abscisic acid concentrations in tomato (*Lycopersicon esculentum*, Ailsa Craig).

#### **Other publications**

Josep Peñuelas, Alistair Jump, Jordi Sardans, Iolanda Filella, Marc Estiarte, Romà Ogaya, Joan Llusà, **Sue Owen**, Francisco Lloret. From phosphorus and VOCs to biodiversity: some studies on the effects of global change inspired by Margalef's legacy. "UNITY IN DIVERSITY. Ecological reflections as a tribute to Margalef". CSIC Madrid 2007.

**Owen SM**, R Donovan, U Skiba, R MacKenzie, D Fowler and CN Hewitt. Air quality and volatile organic compound (VOC) emissions from an urban forest in the UK. *Proceedings of*

the EUROTRAC symposium 2000. ed P. M. Midgley, M. Reuther, and M. Williams Springer-Verlag, 2001, 278 pp.

**Owen S**, C Boissard, B. Hagenlocher and CN Hewitt, Emissions of isoprene from Mediterranean plant species, in *Proceedings of the 1998 EUROTRAC Symposium*, ed P.M. Borrell and P. Borrell. WIT Press, Southampton, 1998.

Puxbaum H, D Simpson, CN Hewitt and **S Owen**, Emissions from Grasslands and Other Vegetation, Chapter 4 in *Emissions from Natural Sources*, ed. D. Simpson and W. Winiwarter, Austrian Federal Ministry for Environment, Youth and Family, Vienna, R-147, 1998, 121 pp.

Simpson D, A Guenther, CN Hewitt, **S Owen**, VA Isodorov, R Steinbrecher, Emissions from Forests, Chapter 1 in *Emissions from Natural Sources*, ed. D. Simpson and W. Winiwarter, Austrian Federal Ministry for Environment, youth and Family, Vienna, R-147, 1998, 121 pp.

### **Conference presentations, lectures and seminars**

- 1994            European Geophysical Union annual meeting, Hamburg, Germany.  
*Presentation (1)* "Biogenic Emissions in the Mediterranean Area"  
*Presentation (2)* "Monoterpene and oxygenated VOC emissions at a mixed woodland site in Northeastern Germany"
- 1995            Forschungszentrum für Umwelt und Gesundheit, Munich, Germany.  
Seminar "Emissions of isoprene and monoterpenes from Mediterranean vegetation"
- 1996            Biogenic Hydrocarbons conference in Virginia, USA.  
*Presentation* "Emissions of isoprene and monoterpenes from Mediterranean plant species sampled in Italy, France and Spain between 1993 and 1996"
- 1997            Laboratoire Interuniversitaire des Systèmes Atmosphériques (LISA), University of Paris, 12 – Créteil.  
*Seminar* "Emissions of isoprene and monoterpenes from north-west Mediterranean vegetation"
- 2000            EUROTRAC 2000 symposium, Garmisch, Germany  
*Poster* "Air quality and volatile organic compound (VOC) emissions from an urban forest in the UK"
- 2000            The Sixth International Conference on Air-Surface Exchange of Gases and Particles. 3rd - 7th July 2000, Edinburgh, UK  
*Presentation* "Extrapolating branch scale measurements of biogenic volatile organic compound (VOC) emissions from urban and rural habitats"
- 2001            PHYTOVOC: An International Workshop on Volatile Organic Compounds (VOCs) produced by plants. Montpellier, France, 22-23 March 2001  
*Presentation* "Effects of biogenic VOC emissions from an urban UK habitat on ozone production"
- 2001            Department of Analytical Chemistry, University of Ljubljana  
*Invited lecture* "Biogenic volatile organic compounds (VOCs): photochemistry, emissions, and environmental controls"

- 2002 EUROTRAC 2002 symposium, Garmisch, Germany  
*Poster* "Urban Tree Air Quality Score: Concepts and Realisation"
- 2002 UGAMP conference (UK Universities Global Atmospheric Modelling Programme) April 10<sup>th</sup> –12<sup>th</sup> 2002 Queens College, Cambridge  
*Presentation* "Biogenic volatile organic compound (VOC) emissions from tropical habitats : Lagrangian modelling issues"
- 2002 Biogenic Hydrocarbons Gordon Conference September 1-6, 2002  
Queens College, Oxford  
*Invited Presentation* "VOC emissions from tropical habitats"
- 2003 University of Cambridge, Atmospheric Chemistry department  
January 30<sup>th</sup>, 2003.  
*Invited seminar* "VOC emissions from tropical habitats"
- 2003 Royal meteorological Society, Atmospheric Chemistry Special Group  
March 27<sup>th</sup>, 2003.  
*Invited presentation* "Hot Stuff!: Biogenic VOC emissions from tropical vegetation"
- 2004 Biogenic Hydrocarbons Gordon Conference May 2-7, 2004  
Il Ciccio, Italy  
*Poster* "Variability in VOC emissions from Oil Palm"
- 2004 ISONET Project meeting, Pieve Tesino, Italy, Sep 20 -24, 2004  
*Presentation* "ABA and volatile isoprenoids in tomato and banana"
- 2005 ISONET Project meeting, Garmisch, Sep, 2005  
*Presentation* "Review of Activities: Plant-animal roles of isoprenoids"
- 2006 ISONET Project meeting, Kuopio, Finland, Nov 28 - 30, 2006  
*Presentation* "Review of Activities: Rhizosphere and leaf isoprenoids"
- 2007 Biogenic Hydrocarbons Gordon Conference Feb 25 – Mar 2, 2007  
Ventura, California  
*Invited presentation* Environmental changes and relationships between essential and volatile isoprenoids ("opportunistic hypothesis")
- 2007 ISONET Final Project Workshop, Sitges, Sep 30 – Oct 1, 2007  
*Presentation* "Volatile isoprenoids in the rhizosphere of Pine species"
- 2007 ESF-VOCBAS Meeting, Montpellier, Oct 2 – Oct 5, 2007  
*Poster* "Volatile isoprenoids in the rhizosphere of Pine species"
- 2008 Seminar on climate change - biosphere interaction, University of Malaysia in Sabah, Kota Kinabalu Jun 2, 2008  
*Presentation* "Aspects of the OP3 research at Danum Valley"
- 2008 9<sup>th</sup> European Meeting on Environmental Chemistry, Girona, Dec 3 – 6, 2007  
*Poster abstract* "Biogenic VOC emissions from oil palm and natural forest canopies in Borneo" (*Abstract was published in the meeting Book of Abstracts, but did not attend due to ill health*)

#### **Co-authored book chapters**

- 2007 Josep Peñuelas, Alistair Jump, Jordi Sardans, Iolanda Filella, Marc Estiarte, Romà Ogaya, Joan Llusà, **Sue Owen**, Francisco Lloret. From phosphorus

and VOCs to biodiversity: some studies on the effects of global change inspired by Margalef's legacy . "UNITY IN DIVERSITY. Ecological reflections as a tribute to Margalef". CSIC Madrid

***Co-authored invited presentations***

- 2006      Josep Peñuelas, Alistair Jump, Jordi Sardans, Francisco Lloret, Iolanda Filella, Marc Estiarte, Romà Ogaya, Joan LLusià, Roger Seco, Martín Garbulsky, Giorgio Alessio, Jenny Hunt, **Sue Owen**, Dolores Asensio, Patricia Prieto, Angela Ribas, Salvador Blanch. Contrasting ecophysiological responses to climate change in Mediterranean ecosystems. Opening doors. Scientific workshop for young researchers. Understanding impacts of climate change on terrestrial ecosystems. Carmona, Sevilla, February 26-March 2, British Council-CSIC.
- 2006      Josep Peñuelas, Joan LLusià, Iolanda Filella, Roger Seco, Giorgio Alessio, **Sue Owen**, Dolores Asensio, Salvador Blanch, Angela Ribas, Marc Estiarte, Romà Ogaya, Sergi Munné-Bosch 2006. The ecophysiology of plant VOC emissions. Need, luxury, serendipity? In "Improving the interpretation and application of plant volatile analysis. A multidisciplinary workshop bringing together European ecologists, chemists & statisticians" Wageningen, The Netherlands, March 15-March 18, European Science Foundation
- 2006      Josep Peñuelas, Alistair Jump, Francisco Lloret, Martín Garbulsky, Iolanda Filella, Marc Estiarte, Romà Ogaya, Joan LLusià, Jordi Sardans, Roger Seco, Giorgio Alessio, Jenny Hunt, **Sue Owen**, Dolores Asensio, Patricia Prieto, Angela Ribas, Bruce Hungate, Salvador Blanch. Historical and remote sensing data on the impacts of precipitation changes on Mediterranean ecosystem functioning. In: "Effect of precipitation changes on terrestrial ecosystems, a workshop of the European Commission and TERACC USA". Elsinore, Denmark.
- 2006      Josep Peñuelas, Iolanda Filella, Marc Estiarte, Joan LLusià, Romà Ogaya, Jordi Sardans, Roger Seco, Giorgio Alessio, Jenny Hunt, **Sue Owen**, Dolores Asensio, Patricia Prieto, Angela Ribas, Salvador Blanch, Alistair Jump, Francisco Lloret, Martín Garbulsky. Ecophysiology in the frame of water-biogeochemical cycles. Water-Biogeochemical cycles Retreat. The Institute for Integrative and Multidisciplinary Earth Sciences, Boulder, Colorado 17-21 July
- 2007      Josep Peñuelas, Marc Estiarte, Romà Ogaya, Iolanda Filella, Alistair Jump, Martín Garbulsky, Jordi Sardans, Joan LLusià, Roger Seco, Giorgio Alessio, Jenny Hunt, **Sue Owen**, Dolores Asensio, Patricia Prieto, Angela Ribas, Benjamin Carrillo, Salvador Blanch, Marta Coll, Shawn Kefauer, Constantí Stefanescu, Francisco Lloret, Jaume Terradas. 2007. "Climate change effects on Mediterranean forests: from observations to experimentation, from genetics to remote sensing". Afforestation and sustainable forests as means to combat desertification. 16-19 April Jerusalem, Israel, pàg 50.

## Appendix 1

### **Field-work experience**

May 1994	Participated in 3 week multi-national field campaign near Rome, Italy, for EC project "Biogenic Emissions in the Mediterranean Area" (BEMA, spring 1994)
Aug 1994	Participated in 3 week multi-national field campaign near Rostock, Germany, for EC project "Photo-Oxidant Formation by Plant Emitted Compounds and OH Radicals in North-Eastern Germany" (POPCORN)
Oct 1994	Planned and organised Lancaster's contribution to, and participated in 3 week multi-national field campaign near Rome, Italy, for EC project "Biogenic Emissions in the Mediterranean Area" (BEMA, autumn 1994)
Jun 1995	Planned and organised Lancaster's contribution to, and participated in 3 week multi-national field campaign near Montpellier, France, for EC project "Biogenic Emissions in the Mediterranean Area" (BEMA, spring 1995)
Sep 1995	Planned and organised Lancaster's contribution to, and participated in 3 week multi-national field campaign near Montpellier, France, for EC project "Biogenic Emissions in the Mediterranean Area" (BEMA, autumn 1995)
Apr 1996	Participated in 1 week multi-national field campaign near Valencia, Spain, for EC project "Biogenic Emissions in the Mediterranean Area" (BEMA, spring 1996)
Aug 1996	Obtained funding for, planned and organised visit to University of Ljubljana for 2-week collaborative experiment
Sep 1996	Planned and organised Lancaster's contribution to, and participated in 3 week multi-national field campaign near Valencia, Spain, for EC project "Biogenic Emissions in the Mediterranean Area" (BEMA, autumn 1996)
May 1997	Planned and organised Lancaster's contribution to, and participated in 3 week multi-national field campaign near Valencia, Spain, for EC project "Biogenic Emissions in the Mediterranean Area" (BEMA, spring 1997)
Aug 1997 to Oct 1997	Obtained NERC small grant funding for, planned and organised visit to National Center of Atmospheric Research, Colorado, USA, for 6-week collaborative experiment
Jan 2000	Obtained Lancaster University Research funding for preliminary field investigations of tropical BVOC emissions at Danum Valley Field Centre, Sabah, BORNEO
Jan 2001	Obtained NERC small grant funding to take part in international collaboration "SAFARI 2001", investigating BVOC emissions from tropical savanna in Maun, Botswana
Jul-Aug 2001	NERC Fellowship, 8 weeks field-work at Danum Valley Field Centre in Borneo investigating BVOC emissions from natural tropical canopies
Sep-Oct 2001	Obtained BES funding to accompany PhD student on field-work in Slovenia, investigating BVOC emissions from Populus species along an alpine-Mediterranean gradient in Slovenia, and to sample soils for microbial degradation of monoterpenes.
Jun 2002	Invited collaboration to continue BVOC sampling in Slovenia.

Mar 2003	Royal Society funding to take part in international collaboration investigating BVOC emissions from tropical plantation species in Xishuangbanna, Yunnan, China.
Feb-Mar 2004	NERC Fellowship, 6 weeks field-work in Borneo investigating BVOC emissions from natural and plantation tropical canopies
May 2005	Invited collaboration to continue studies of BVOC emissions from tropical plantation species in Xishuangbanna, Yunnan, China.
May 2007	Invited collaboration to screen native and invasive tropical species for BVOC Emissions in Hawaii.
May-June 2008	Coordinated team of International researchers to measure emissions and their controls of BVOCs from natural tropical forest and oil palm plantations in Borneo. Supervised PhD students during the field work

## Appendix 2

### Student projects supervised

*TITLE:* Modelling the fate of biogenic emissions from tropical rainforest

*Ph. D. STUDENT:* Thomas Pugh

*UNIVERSITY:* Lancaster, UK

*FACULTY/SCHOOL:* Environmental Science

*YEAR:* 2007-2010

*TITLE:* Controls of isoprene emissions from oil palm

*Ph. D. STUDENT:* Michael Wilkinson

*UNIVERSITY:* Lancaster, UK

*FACULTY/SCHOOL:* Environmental Science

*YEAR:* 2002-2006                      *MARK:* pass (*small corrections only*)

*TITLE:* Comparing the role of monoterpenes with other defence mechanisms in plants

*Ph. D. STUDENT:* Alona Linotac

*UNIVERSITY:* University of Malaysia in Sabah

*FACULTY/SCHOOL:* Biology

*YEAR:* 2001-2009 (part-time)

*TITLE:* Isoprene Emissions from Mediterranean Vegetation

*M.Sc. STUDENT:* Bernt Hagenlocher

*UNIVERSITY:* Lancaster, UK

*FACULTY/SCHOOL:* Environmental Science

*YEAR:* 1997-1998                      *MARK:* distinction

*TITLE:* Investigating Biogenic Volatile Organic Compounds (VOC's) As Potential Carbon Sources For Soil Microflora

*M.Sc. STUDENT:* Stewart Clarke

*UNIVERSITY:* Lancaster, UK

*FACULTY/SCHOOL:* Environmental Science

*YEAR:* 2001-2002                      *MARK:* pass

*TITLE:* Biodegradation of 2,4-dcp in the presence of volatile organic compounds in soils under different vegetation types.

*M.Sc. STUDENT:* Angela Rhodes

*UNIVERSITY:* Lancaster, UK

*FACULTY/SCHOOL:* Environmental Science

*YEAR:* 2002-2003                      *MARK:* distinction

*TITLE:* Investigating biogenic volatile organic compounds as a potential stimulator for pollutant degradation by soil microorganisms.

*M.Sc. STUDENT:* Emma McCloughlin

*UNIVERSITY:* Lancaster, UK

*FACULTY/SCHOOL:* Environmental Science

*YEAR:* 2003-2004                      *MARK:* distinction

*TITLE:* How do concentrations of isoprenoid compounds in foliage change as plants develop?

*M.Sc. STUDENT:* Taichiro Yamakawa

*UNIVERSITY:* Lancaster, UK

*FACULTY/SCHOOL:* Environmental Science

*YEAR:* 2004-2005                      *MARK:* pass

*TITLE:* Feasibility Study on Measuring Plant Root Emissions of Monoterpenes

*M.Sc. STUDENT:* Chun Lin

*UNIVERSITY:* Lancaster, UK

*FACULTY/SCHOOL:* Environmental Science

*YEAR:* 2004-2005                      *MARK:* distinction

*TITLE:* Modelling the effects of biogenic monoterpenes and sesquiterpenes on ozone and secondary organic aerosol production over Borneo, SE Asia.

*M.Sc. STUDENT:* James Ryder

*UNIVERSITY:* Lancaster, UK

*FACULTY/SCHOOL:* Environmental Science

*YEAR:* 2004-2005

*MARK:* distinction