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Research Experience

2016 - 2018 **United Kingdom Earth System Model (UKESM) Evaluation**

The UK Met Office and Natural Environment Research Council (NERC) are developing a fully interactive earth system model combining atmosphere, ocean, land-surface, cryosphere, geochemical cycle and atmospheric chemistry component models. My role is to evaluate the UKESM atmospheric chemistry simulation skill using satellite composition data (e.g. tropospheric column NO₂).

2015 - 2018 **National Centre for Earth Observation (NCEO) Core Work**

Utilising chemistry transport models (CTMs) and satellite datasets of atmospheric composition to investigate changes in regional and global air quality, the impacts of meteorological systems (e.g. North Atlantic Oscillation) and land-use changes (e.g. biomass burning) on tropospheric composition and development of the NCEO modelling framework.

2015 - 2016 **Desert Storms Project**

My role was to analyse Met Office dust forecast and assimilation data over northern Africa to identify potential model processes (e.g. transport, dust uplift and land surface properties), which influenced model-satellite aerosol optical depth biases.

Qualifications

2011 - 2015 **PhD** in Air Quality Modelling and Satellite Observations – University of Leeds
Thesis title: “*The meteorological and chemical processes influencing UK air quality investigated using satellite observations and modelling*”. Supervised by Martyn Chipperfield and Nick Savage. Funded by the NCEO and Met Office.

2007 - 2011 **Masters of Science (MSci) – Meteorology and Oceanography (1st)** – University of East Anglia

2001 - 2007 **A Level Maths, Geography and Politics (AAB)**; AS Level Physics (B); 10 GCSEs (A* - C) – Exeter College and West Exe Technology College

Key Peer-reviewed Publications

Pope, R. J., Butt, E. W., Chipperfield, M. P., Doherty, R. M., Fenech, S., Schmidt, A., Arnold, S. R., and Savage, N. H.: The impact of synoptic weather on UK surface ozone and implications for premature mortality, *Environ. Res. Lett.*, 11, 124004, doi:10.1088/1748-9326/11/12/124004, 2016.

Pope, R. J., Marsham, J. H., Knippertz, P., Brooks, M. E., and Roberts, A. J.: Identifying errors in dust models from data assimilation. *Geophys. Res. Letts.*, doi:10.1002/2016GL070621, 2016.

Pope, R. J., Chipperfield, M. P., Savage, N. J., Ordonez, C., Neal, L. S., Lee, L. A., Dhomse, S. S., Richards, N. A. D., and Keslake, T. D.: Evaluation of a regional air quality model using satellite column NO₂: treatment of observational errors and model boundary conditions and emissions, *Atmos. Chem. Phys.*, 15, 5611-5626, doi:10.5194/acp-15-5611-2015, 2015.

Pope, R. J., Savage, N. H., Chipperfield, M. P., Arnold, S. R., and Osborn, T. J.: The influence of synoptic weather regimes on UK air quality: Analysis of satellite column NO₂, *Atmos. Sci. Letts.*, doi:10.1002/asl2.492, 2014.

Acted as a reviewer for multiple journals including Atmospheric Environment, Atmospheric Chemistry and Physics, International Journal of Biometeorology and International Journal of Remote Sens

Selected Conference Presentations & Meeting Organisation

- Mar 2016 Air Quality – Science and Application, Milan, Italy
Pope, R. J., Chipperfield, M. P., and Savage, N. H.: The Influence of Synoptic Weather Regimes on UK Air Quality: Tropospheric Column NO₂. (**Invited Speaker**).
- Jun 2016 DUST 2016 – International Conference on Atmospheric Dust, Taranto, Italy
Pope, R. J., Marsham, J. H., Knippertz, et al.: Identifying Errors in Dust Models from Data Assimilation over Northern Africa. (**Oral presentation**).
- Mar 2014 National Centre for Earth Observation Young Persons Conference, Leeds, UK
My role was to organise a 2 day conference for up to 20 NCEO young scientists, which included presentations, poster sessions and guest speakers. This involved booking conference facilities, organising participant accommodation/meals and chairing the event.

Teaching, Supervising & Funding

Lecturing: Given lectures on the University of Leeds “SOEE3190 Earth Observations from Space” course about detection of atmospheric composition and clouds from space.

Supervision: Two proposals for summer student funding in 2016 and 2017 were successful leading to my primary supervision of projects investigating weather - surface air quality interactions and power station plume modelling. I co-supervised the 2016 summer student who undertook their final year project based on their placement work.

Demonstrator: Several undergraduate modules (e.g. Environment Maths and Physics, Computer Programming, Numerical Methods) involved supporting seminars, delivering tutorials to 15-20 students, marking course work and supervising students on field trips.

Technical Skills

Atmospheric Chemistry Modelling Skills

Extensive experience of the following:

- Running global/regional atmospheric chemistry models on supercomputing platforms.
- Modifying model subroutines (FORTRAN) and altering the setup of the model.
- Processing/analysing large model and observational datasets in numerous file formats.

General Computing Skills

High proficiency using the following:

- Unix/Linux and Windows operating systems.
- IDL programming language and data visualisation.
- Latex document generation software.
- Microsoft Office software.

Referees

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Name: Dr John Marsham

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