CARLY REDDINGTON CURRICULUM VITAE

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Current Research Jan 2017 to Present

Improving air quality in Hong Kong & Pearl River Delta
Rapid economic growth combined with inadequate environmental legislation has led to serious air quality problems in many parts of Asia. I aim to identify and prioritise realistic and effective measures to rapidly mitigate poor air quality across Asia, with a focus on developing solutions for the Pearl River Delta and Hong Kong – now the largest urban area in the world. I am currently using a state-of-the-art regional air quality model (WRF-Chem) in combination with recent in-situ and satellite measurements of air pollutants to assess the contribution of different emission sectors (e.g. power generation, transport, residential fuel combustion etc.) to air pollutant concentrations in the Pearl River Delta region.

Research Experience

Jan. 2017 – Present **Part-time Postdoctoral Research Fellow (80%)**, University of Leeds, UK
Project: Improving air quality in Hong Kong & Pearl River Delta: Turning new knowledge into policy and action.

[May 2016 – Jan 2017: Maternity leave]

2013 – 2016 **Postdoctoral Research Fellow**, University of Leeds, UK
Projects: The South American Biomass Burning Analysis (SAMBBA) Project and the Global Synthesis Science Project (GASSP).

2012 – 2013 **Research Support Scientist**, University of Leeds, UK

Qualifications

2008 – 2012 **PhD** in Atmospheric Science, University of Leeds, UK
Thesis title: "Primary versus secondary contributions to particle number concentrations in the European boundary layer". Supervised by Prof K. Carslaw; funded by the European Integrated project on Aerosol Cloud Climate and Air Quality Interactions (EUCAARI).

2003 – 2007 **Master of Physics (Hons) Physics with Astrophysics (2:1)**, University of Leeds, UK
2005 – 2006 Study abroad year at Pennsylvania State University, USA.

Publications

32 peer-reviewed publications to date; 6 as lead author, 26 as co-author.

***h*-index: 15 on Scopus; 14 on Web of Science; 16 on Google Scholar**
Researcher ID: I-3390-2015; https://scholar.google.co.uk/citations?user=9xrwQpcAAAAJ&hl=en

Peer-reviewed publications & Scopus citations

32. Scott, CE et al (including **Reddington CL**): Impact on short-lived climate forcers increases projected warming due to deforestation, *Nature Communications*, 2018.
31. Butt, EW, et al (including **Reddington CL**): Global and regional trends in particulate air pollution and attributable health burden over the past 50 years, *Environ. Res. Lett.*, 2017.
30. **Reddington, CL**, et al: The Global Aerosol Synthesis and Science Project (GASSP): Measurements and modelling to reduce uncertainty, *Bull. Am. Meteorol. Soc.*, 2017.
29. Liu D, et al (including **Reddington, CL**): Black-carbon absorption enhancement in the atmosphere determined by particle mixing state, *Nat. Geosci.*, 2017. [9 citations]
28. Schmale, J, et al (including **Reddington, CL**): Collocated observations of cloud condensation nuclei, particle size distributions, and chemical composition, *Scientific Data*, 2017.

27. Scott, CE, et al (including **Reddington, CL**): Impact on short-lived climate forcers (SLCFs) from a realistic land-use change scenario: Via changes in biogenic emissions, *Faraday Discuss.*, 2017.
26. Dunne, EM, et al (including **Reddington, CL**): Global atmospheric particle formation from CERN CLOUD measurements, *Science*, 2016. [16 citations]
25. **Reddington, CL**, et al: Analysis of particulate emissions from tropical biomass burning using a global aerosol model and long-term surface observations, *Atmos. Chem. Phys.*, 2016. [**9 citations; Altmetrics: 19**]
24. O'Sullivan, M, Rap, A, **Reddington, CL**, et al: Small global effect on terrestrial net primary production due to increased fossil fuel aerosol emissions from East Asia since the turn of the century, *Geophys. Res. Lett.*, 2016.
23. Baranizadeh, E, et al (including **Reddington, CL**): Implementation of state-of-the-art ternary new particle formation scheme to the regional chemical transport model PMCAMx-UF in Europe, *Geosci. Model Dev.*, 2016.
22. Kapadia, ZZ, et al (including **Reddington, CL**): Impacts of aviation fuel sulfur content on climate and human health, *Atmos. Chem. Phys.*, 2016. [2 citations]
21. Turnock, ST, et al (including **Reddington, CL**): The impact of European legislative and technology measures to reduce air pollutants on air quality, human health and climate, *Environ. Res. Lett.*, 2016. [7 citations]
20. Lee, LA, **Reddington, CL**, and Carslaw, KS: On the relationship between aerosol model uncertainty and radiative forcing uncertainty, *Proc. Natl. Acad. Sci. U.S.A.*, 2016. [5 citations]
19. Butt, EW, et al (including **Reddington, CL**): Short-term impacts of residential solid fuel combustion on atmospheric aerosol, human health and climate, *Atmos. Chem. Phys.*, 2016. [15 citations]
18. **Reddington, CL**, et al: Air quality and human health improvements from reductions in deforestation-related fire in Brazil, *Nat. Geosci.*, 2015. [**20 citations; Altmetrics: 150**]
17. Rap, A, et al (including **Reddington, CL**): Fires increase Amazon forest productivity through increases in diffuse radiation, *Geophys. Res. Lett.*, 2015. [20 citations]
16. Spracklen DV, **Reddington, CL**, Gaveau, DLA: Industrial concessions, fires and air pollution in Equatorial Asia, *Environ. Res. Lett.*, 2015. Perspective Article. [4 citations]
15. Regayre, LA, et al (including **Reddington, CL**): The climatic importance of uncertainties in regional aerosol-cloud radiative forcings over recent decades, *J. Climate*, 2015. [4 citations]
14. Hamilton, DS, et al (including **Reddington, CL**): Occurrence of pristine aerosol environments on a polluted planet, *Proc. Natl. Acad. Sci. U.S.A.*, 2014. [18 citations]
13. Regayre, LA, et al (including **Reddington, CL**): Uncertainty in the magnitude of aerosol-cloud radiative forcing over recent decades, *Geophys. Res. Lett.*, 2014. [13 citations]
12. **Reddington, CL**, et al: Contribution of vegetation and peat fires to particulate air pollution in Southeast Asia, *Environ. Res. Lett.*, 2014. [**23 citations; Altmetrics: 21**]
11. Mann, GW, Carslaw, KS, **Reddington, CL**, et al: Intercomparison and evaluation of global aerosol microphysical properties among AeroCom models of a range of complexity, *Atmos. Chem. Phys.*, 2014. [44 citations]
10. Carslaw, KS, Lee, LA, **Reddington, CL**, et al: Large contribution of natural aerosols to uncertainty in indirect forcing, *Nature*, 2013. [213 citations]
9. Carslaw, KS, Lee, L, **Reddington, CL**, et al: The magnitude and sources of uncertainty in global aerosol, *Faraday Discuss.*, 2013. [13 citations]
8. Lee, LA, Pringle, KJ, **Reddington, CL**, et al: The magnitude and causes of uncertainty in global model simulations of cloud condensation nuclei, *Atmos. Chem. Phys.*, 2013. [78 citations]
7. **Reddington, CL**, et al: The mass and number size distributions of black carbon aerosol over Europe, *Atmos. Chem. Phys.*, 2013. [**26 citations**]
6. Laakso, L, et al (including **Reddington, CL**): Boundary layer nucleation as a source of new CCN in savannah environment, *Atmos. Chem. Phys.*, 2013. [17 citations]
5. Dunne, EM, Lee, LA, **Reddington, CL**, et al: No statistically significant effect of a short-term decrease in the nucleation rate on atmospheric aerosols, *Atmos. Chem. Phys.*, 2012. [12 citations]

4. Mann, GW, et al (including **Reddington, CL**): Intercomparison of modal and sectional aerosol microphysics representations within the same 3-D global chemical transport model, *Atmos. Chem. Phys.*, 2012. [44 citations]
3. Kulmala, M, et al (including **Reddington, CL**): General overview: European Integrated project on Aerosol Cloud Climate and Air Quality interactions (EUCAARI) – integrating aerosol research from nano to global scales, *Atmos. Chem. Phys.*, 2011. [131 citations on Scopus]
2. **Reddington, CL**, et al: Primary versus secondary contributions to particle number concentrations in the European boundary layer, *Atmos. Chem. Phys.*, 2011. [**55 citations**]
1. Spracklen, DV, et al (including **Reddington, CL**): Explaining global surface aerosol number concentrations in terms of primary emissions and particle formation, *Atmos. Chem. Phys.*, 2010. [142 citations]

Grants

- **UK-Southeast Asia Knowledge Partnership Collaboration Development Award** (£2000). Funding from the British Council Singapore for UK-based researchers to visit Southeast Asia to explore and define areas for future research collaborations (Dec 2014).
- **Climate and Geohazard Services (CGS) University of Leeds funding** (~£350). Funding for 2-day visit to the UK Met Office to work with the Atmospheric Dispersion and Air Quality group (Jun 2015).
- **Royal Society of Chemistry Travel Grants** (£1600). Funding to attend iLEAPS Science Conference in Nanjing, China (Mar 2014) and AGU Fall Meeting in San Francisco, USA (Dec 2015).

Selected Conference Presentations

Invited oral presentations

1. **International Workshop on Air Quality in Asia**, Bogor, Indonesia (Aug 2015): Impact of vegetation and peat fires on air quality and human health in Southeast Asia.
2. **Institute of Physics Environmental Physics Day**, University of Reading, UK (May 2015): Modelling biomass burning aerosol and its impacts on radiation and the biosphere.
3. **American Geophysical Union Fall Meeting**, San Francisco, USA (Dec 2014): Evaluation of tropical biomass burning emissions using a global aerosol model: implications for climate and air quality.

Oral presentations

1. **Researcher Links Workshop: The impact of rapid urbanisation on health in Chinese mega-cities**, Xiamen, China (Nov 2017): Impact of regional scale emissions air quality in cities in South China and Mainland Southeast Asia.
2. **5th iLEAPS Science Conference**, Oxford, UK (Sep 2017): Impact of biomass burning on air quality in South China and Mainland Southeast Asia.
3. **American Geophysical Union Fall Meeting**, San Francisco, USA (Dec 2015): Air quality and human health improvements from reduced deforestation in Brazil.
4. **American Geophysical Union Fall Meeting**, San Francisco, USA (Dec 2014): Using a comprehensive synthesis of aerosol observations and statistical modelling to constrain model uncertainty.
5. **American Geophysical Union Fall Meeting**, San Francisco, USA (Dec 2013): Tropical biomass burning is a larger than expected source of black carbon aerosol.

Teaching & Supervision

- **Co-supervisor** of one Master of Research project, three undergraduate final year dissertations and one undergraduate summer project (2012 – 2018). Providing input on project objectives; guidance on research direction, data analysis and visualisation; and assistance with programming languages and running atmospheric-chemistry models.
- **Technical support role** for the aerosol modelling research group (2012 – 2013); providing support for an atmospheric aerosol model and guidance on data analysis and visualisation.
- **Demonstrator** for undergraduate module "Physics for Environmental Science" (2009 – 2011); delivering weekly tutorials for up to 20 students to support lectures.

Seminar & Meeting Organisation

- **Organiser of UK WRF-Chem Users Meeting** (to take place in Jun 2018).
- **Scientific organising committee member for the 6th NCAS Composition-Climate Interaction Meeting** (Mar 2016).
- **Sole coordinator of the ICAS Internal Seminar Series** (2013 – 2015).
- **Organiser of weekly group meetings and monthly technical meetings for the aerosol modelling research group** (2012 – 2015).

Technical Skills

Aerosol modelling skills

Extensive experience of the following:

- Running complex atmospheric chemistry-aerosol models (WRF-Chem and GLOMAP) on multiple supercomputing platforms.
- Writing and modifying subroutines in the model code (FORTRAN).
- Handling and analysing large model and observational datasets in a range of file formats.

General computing skills

High proficiency using the following:

- Unix/Linux and Windows operating systems.
- IDL programming language.
- Latex document preparation system.
- Microsoft Office applications.

Good experience of the following:

- Statistical analysis using R.
- Altering model code written in FORTRAN.
- Writing scripts using Perl or Bash programming/command languages.

Additional Skills

- **Excellent communication skills** developed through demonstrating, research and technical support work, oral conference presentations, and scientific discussions with colleagues and collaborators.
- **Excellent organisational skills** demonstrated by coordination of seminars and technical meetings and ability to balance two distinct research projects with minimal need for guidance.
- **Strong technical writing skills** demonstrated by number and standard of publications.

Journal Reviews

I have reviewed papers in the following scientific journals: **Nature Geoscience**; **Atmosphere**, **Atmospheric Chemistry and Physics**; **Environmental Research Letters**; **Journal of Geophysical Research – Atmospheres**; **Atmospheric Environment**; and **Geoscientific Model Development**.