UNIVERSITY OF LEEDS

ICAS Newsletter

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Institute for Climate and Atmospheric Science

SCHOOL OF EARTH & ENVIRONMENT http://www.see.leeds.ac.uk/research/icas/

OUR PARTNERSHIPS: CENTRE FOR POLAR OBSERVATION AND MODELLING (CPOM)

CPOM Director **Andy Shepherd**, Independent Research Fellow **Anna Hogg** and PhD student **Adriano Lemos** took part in the ESA CryoVEx/KAREN campaign, which is collecting airborne and ground-based measurements to compare how the different radars on CryoSat and the French-Indian Altika satellite mission penetrate the snow overlying the ice sheet. Travelling to Western Palmer Land on the Antarctic Peninsula, they took ice core samples at several sites directly under CryoSat's orbital path which can now be compared with the satellite as well as airborne measurements.

Read more on page 8

Photo: Collecting ice core on Antartic Peninsula. Credit: Andrew Shepherd.

INSIDE THIS ISSUE

MESSAGE FROM OUR DIRECTOR

Martyn Chipperfield:
Welcome to the latest edition of the ICAS newsletter.
I hope you enjoy reading about just some of the recent activities in the Institute and that the articles convey the size and vibrancy of ICAS. The topics covered in this issue range from high profile papers, funding success, fieldwork reports, new developments in modelling support, outreach activities and updates from our six partnerships with national and international organisations. These topics involve staff at all career stages and span an impressive range of scientific activities – from Antarctic ice to upper atmosphere chemistry.

STOP PRESS

We are pleased to announce the ICAS winners for 2017/18 Postgraduate Researcher Publications Prize 2017/18 as being:

Ilkka Matero - Matero, I. S. O., Gregoire, L. J., Ivanovic, R. F., Tindall, J. C., & Haywood, A. M. (2017). The 8.2 ka cooling event caused by Laurentide ice saddle collapse. Earth and Planetary Sciences Letters 473. p. 205-214. https://doi.org/10.1016/j.epsl.2017.06.011

Jesús Vergara Temprado - Vergara-Temprado, J., Murray, B. J., Wilson, T. W., O'Sullivan, D., Browse, J., Pringle, K. J., Ardon-Dryer, K., Bertram, A. K., Burrows, S. M., Ceburnis, D., DeMott, P. J., Mason, R. H., O'Dowd, C. D., Rinaldi, M., and Carslaw, K. S.: Contribution of feldspar and marine organic aerosols to global ice nucleating particle concentrations, Atmos. Chem. Phys., 17, 3637-3658, https://doi.org/10.5194/acp-17-3637-2017

ISAAC NEWTON INSTITUTE AND SIMONS FELLOWSHIP

Dr Lindsay Lee is a Leverhulme Research Fellow in ICAS. Here she talks about her recent collaboration with the Isaac Newton Institute (INI) for Mathematical Sciences in Cambridge and the award of a Simons Fellowship.

"In 2016 I was asked to co-organise a week-long workshop 'Surrogate models for uncertainty quantification (UQ) in complex systems' to take place in February 2018 at the Isaac Newton Institute for Mathematical Sciences in Cambridge. The workshop was to be part of a bigger 6-month-long programme 'Uncertainty quantification for complex systems: theory and methodologies'. The main aim is to bring applied mathematicians and statisticians together to formulate a common mathematical foundation for UQ and to establish long-lasting interactions that will lead to significant advances in UQ theory and methodologies for complex systems. As a workshop organiser I was also invited to attend any or all of the programme as a participant, meaning all accommodation costs and workshop fees would be covered. Since only 22 programme participants can be funded at any one time this was a huge privilege and, together with my family, I arranged to stay for just over two months. The Leverhulme Trust, who fund my early career fellowship, were happy for me to attend and fund the travel and subsistence. However, later in 2017 I was also nominated for, and subsequently received, a Simons Fellowship to cover up to £1000 in travel and £25 per diem throughout my stay. The Simons Foundation is a US-based initiative supporting research in mathematics, theoretical physics and theoretical computer science. To receive the Fellowship was a further honour and to be recognised in such a way for my own research has been incredible. I'm very grateful to all those that have supported me to make this happen, including my colleagues in Leeds.

I have now completed my time at the INI, although I have been given the option to return which I may do for a week or two in June before the programme ends. I am pleased to say our workshop was a great success with lots of interesting talks, a great poster session and some really interesting panel discussions to help bring together the work of the statisticians and applied mathematicians. During my time at the INI I have been able to interact with some of the top mathematicians and statisticians in the world and what I have learnt from them has been invaluable. I have also been able to begin a collaboration with two of my statistician heroes without whose software I would not have been able to do the work I have in Leeds. I have left Cambridge with lots of new ideas and new ways forward …now to find the extra time…"

FEATURED PAPER #1:
LIGHTNING STORMS LESS LIKELY IN A WARMING PLANET

Global warming may lead to a drop in lightning strikes, affecting atmospheric composition and the frequency of natural forest fires in the tropics. Using a newly-devised method, scientists including Leeds-based **Dr Declan Finney** and **Professor Alan Blyth** in a study published in Nature Climate Change, have forecast a 15% drop in the average number of lightning flashes worldwide by the year 2100, if global temperatures continue on their predicted upward trend.

Study lead author Declan Finney, now at ICAS, carried out this research while based at the University of Edinburgh. He said: “Our method looked closely at the impact of climate change on the fundamental components that lead to lightning. Global warming over the next century is expected to alter atmospheric temperature, humidity and stability. This would have a significant effect on the ice particles and soft hail which build up electrical charge when they collide in thunderstorms. It’s this charge in clouds that generates the lightning flashes and thunder during storms. Increases in the amount of cloud ice or the strength of the updraughts in the clouds leads to an increase in the charge generated and therefore the number of lightning flashes. The climate change scenario used in the study was an approximate 5^{o}C rise in global temperatures by 2100. Under this scenario there are large impacts on the formation and movement cloud ice particles, leading to a significant drop in lightning occurrence.”

Lightning is an important source of nitric oxide (NO) – which is a precursor of ozone, and which influences the lifetime of methane. Both ozone in the lower atmosphere and methane are important greenhouse gases, and changes in their concentrations can lead to warming or cooling effects on the atmosphere. The study calls for lightning simulated in chemistry-climate models to incorporate more of the underlying physics of lightning generation, and thereby better simulate the interactions and feedbacks between atmospheric composition and climate change.

Declan adds: “Understanding the future changes in lightning is of importance to predicting subsequent changes in aerosol chemistry, natural wild-fires ignited by lightning strikes, and lightning damage to infrastructure. The largest difference we observed was in the tropics, where the most lightning occurs and are the main source of ignition for natural wild-fires. The method here, which relates the motions of cloud ice to lightning activity, incorporates much more of the fundamental physics governing lightning formation than previous methods applied to simulations of climate change. Our research questions the reliability of previous projections of lightning, and encourages further study into the effects of climate change on cloud ice and lightning.”

Study co-author Professor Alan Blyth, Director of Atmospheric Physics at NCAS, said: “The new results showing a decrease of lightning in a future climate are interesting and challenge not only the way of representing lightning in chemistry-climate models in a more physically-based way, but also mixed-phase clouds – clouds that are made up of supercooled cloud droplets and ice crystals. Previous studies have used cloud-top height to predict lightning frequency and the potential impact of climate change. While these methods have indicated global warming could lead to an increase in lightning occurrences, the study highlights the weaknesses in this approach, including the fact that lightning is not caused by the height of the cloud but by the electrical charge built up through collisions of ice particles.

Declan L. Finney, Ruth M. Doherty, Oliver Wild, David S. Stevenson, Ian A. MacKenzie & Alan M. Blyth. A projected decrease in lightning under climate change. Nature Climate Change 8, pages210–213 (2018). doi:10.1038/s41558-018-0072-6

FEATURED PAPER #2:
NEW INSIGHT INTO CLIMATE IMPACTS OF DEFORESTATION

Deforestation is likely to warm the climate even more than originally thought, according to new ICAS research. An international team of scientists, led by ICAS, studied the way that reactive gases emitted by trees and vegetation affect the climate. Research, published in Nature Communications, found these reactive gases cool our climate, meaning deforestation would lead to higher temperatures than previously anticipated as less of the gases would be created.

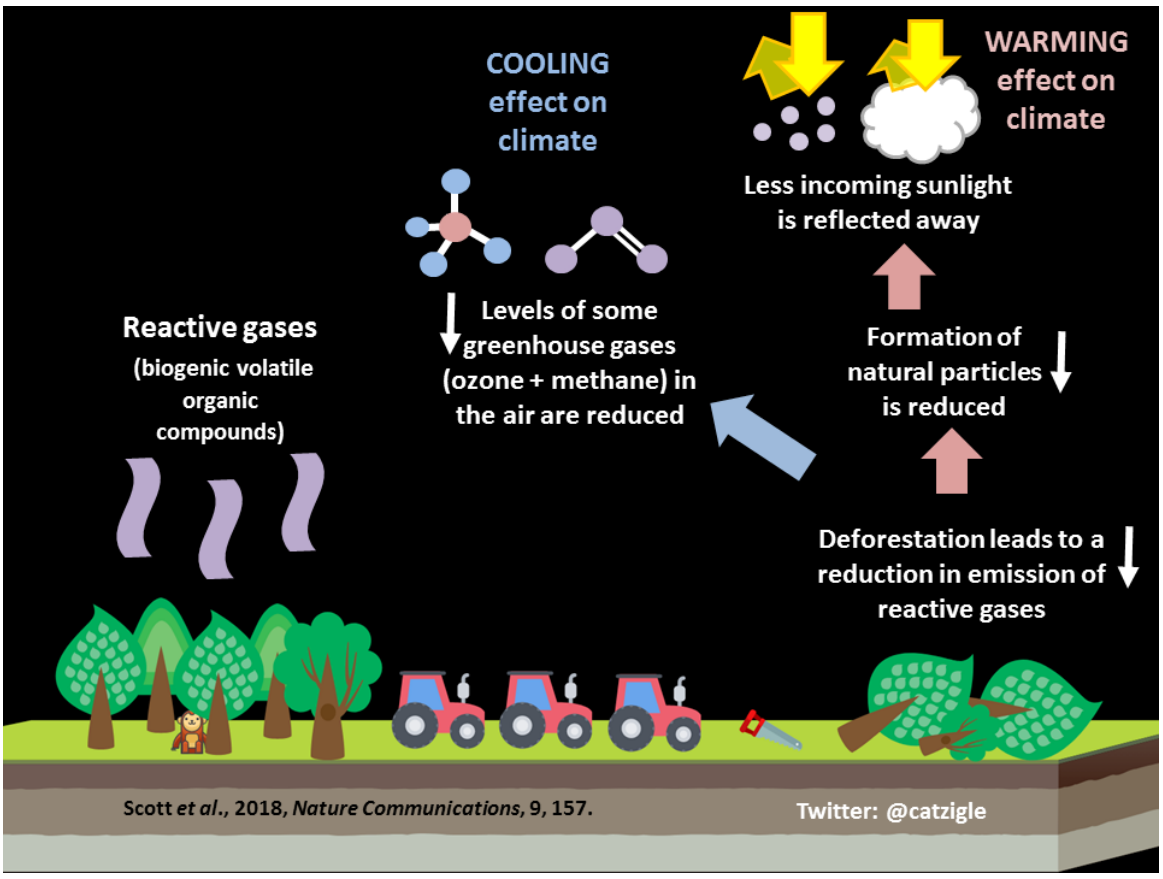
Study lead author **Dr Cat Scott** said: "Most previous assessments on the climate impacts of deforestation have focused on the amount of carbon dioxide that would be emitted, or changes to the way the land-surface exchanges energy and water with the atmosphere. But as well as taking in carbon dioxide and giving out oxygen, trees emit other gases that take part in complicated chemical reactions in the atmosphere and there are implications for reducing these gases. The warming and cooling effects of these gases are most closely balanced in the tropics, which is where most deforestation is occurring – suggesting that we really need to understand more about the strength of these impacts".

The team assessed the complex ways in which reactive gases emitted by forests can impact our climate. Once in the air, gases emitted by forests react with other atmospheric chemicals to form tiny particles. These particles can reflect sunlight back to space, cooling the climate. However, the reactive gases emitted by trees can also increase the amounts of ozone and methane, both greenhouse gases which have warming effects on the climate. The team used computer models, developed at maintained in ICAS, to calculate these different warming and cooling effects.

Study co-author, **Professor Dominick Spracklen** said: "Scientists have known for a long time that trees emit reactive gases to the atmosphere. However, the impact these gases have on the climate has until now not been as widely studied as the effects of carbon dioxide emissions. By understanding these complex effects we now know more about how forests are affecting our climate, and we are able to see a clearer picture of the repercussions of deforestation. We found that the cooling impacts of these gases outweigh the warming impacts, meaning that reactive gases given out by forests have an overall cooling effect on our climate."

C. E. Scott, S. A. Monks, D. V. Spracklen, S. R. Arnold, P. M. Forster, A. Rap, M. Äijälä, P. Artaxo, K. S. Carslaw, M. P. Chipperfield, M. Ehn, S. Gilardoni, L. Heikkinen, M. Kulmala, T. Petäjä, C. L. S. Reddington, L. V. Rizzo, E. Swietlicki, E. Vignati & C. Wilson. mpact on short-lived climate forcers increases projected warming due to deforestation. Nature Communications 9, Article number: 157 (2018) doi:10.1038/s41467-017-02412-4

Image Credit: Cat Scott.



FEATURED PAPER #3:
CAUSE OF LONG-STANDING ERROR IN CLIMATE MODELS FINALLY IDENTIFIED

Current Global Climate Models currently simulate clouds reflecting far less solar radiation than observations indicate the Southern Ocean. These biases mean they can't accurately forecast sea surface temperatures, atmospheric circulation, and climate sensitivity. New ICAS ice nucleation research has clearly highlighted the cause of these errors.

Scientists from the Met Office and University of Leeds have collaborated on this research as part of a Joint Research Unit (JRU) between the two Institutions. Co-author **Profesoor Paul Field** holds a Chair in Climate Science at ICAS and jointly leads research into cloud microphysical processes at the Met Office. The lead author **Jesus Vergara-Temprado** is an ICAS postgraduate researcher looking at "Global modelling of ice nucleating particles". He is co-supervised by co-authors **Professors Ken Carslaw and Ben Murray**. This paper is a direct result of the fruitful partnership between Leeds and the Met Office. **Read more on the partnership on pages 8&9.**

The results show that the low concentrations of ice-nucleating particles in the Southern Ocean play a critical role in explaining this model bias. They limit the amount of rain and the clouds are therefore much brighter means they reflect far more solar radiation than models currently show. These new results mean current global models now need to rise to the challenge of integrating these new results within their codes and one day finally reflect reality.

Jesús Vergara-Temprado, Annette K. Miltenberger, Kalli Furtado, Daniel P. Grosvenor, Ben J. Shipway, Adrian A. Hill, Jonathan M. Wilkinson, Paul R. Field, Benjamin J. Murray and Ken S. Carslaw. Strong control of Southern Ocean cloud reflectivity by ice-nucleating particles. PNAS (2018). doi.org/10.1073/pnas.1721627115

Photos:
Top - Credit: Peter Knippertz.
Bottom - Credit: Paul Smith.

SUCCESSES & CONGRATULATIONS

Professor Dominick Spracklen awarded a prestigious ERC Consolidator grant.

Professor Dominick Spracklen has secured highly prestigious European Research Council funding worth £2 million euros over the next five years.

ERC Consolidator grants support innovative and high-impact research. Professor Spracklen's research team will explore the climate and air quality impacts of tropical deforestation.

Promotion to Associate Professor

Congratulations to **Dr Mal McMillan** on his promotion to Associate Professor in Polar Satellite Geodesy.

Read more about Mal in our featured Person section on page 12.

Editors in Sustainable Food Systems journal

Andy Challinor and Stephen Whitfield (SRI) are joint Chief Editors of a new Section of the Frontiers in Sustainable Food Systems journal - 'Climate Smart Food Systems'.

Their editorial paper for the section is linked here: **https://doi.org/10.3389/fsufs.2018.00002**

IN THE NEWS

Professor Ben Murray was involved in the making of the BBC Brainwaves programme on Snow and Ice. It was broadcast on BBC Radio Scotland Wednesday 27th December, 2017.

Listen again on the Brainwaves webpage: **http://www.bbc.co.uk/programmes/b09kf9y1**

Dr Declan Finney was interviewed on Radio 4 about his recent Nature Climate Change paper on lightning (see page 3) **http://www.bbc.co.uk/programmes/b09r3nnp** at 53 minutes.

FUNDING SUCCESS FOR FUTURE CLIMATE FOR AFRICA

1. **Alex Roberts, John Marsham and Lawrence Jackson** secured a Future Climate for Africa (FCFA) gap-filling award (£88k) to assess the impacts of seasonally varying vegetation on surface fluxes over West Africa and their role in the region's meteorology and climate. The project will bring together researchers from Université Félix Houphouët Boigny, Abidjan, Côte d'Ivoire and the University of Leeds, linking with the wider IMPALA project within FCFA.

2. **Declan Finney and John Marsham** obtained funding for a project to understand future changes of rainfall and extreme rainfall over Ethiopia. This project will bring together researchers from East Africa's IGAD Climate Prediction and Applications Centre with researchers at Leeds, linking with the HyCRISTAL project within FCFA.

3. **Declan Finney (lead investigator), John Marsham and Lawrence Jackson** have been awarded a NERC gap-filling project (£76k) to investigate the potential impacts of climate change in Ethiopia and South Sudan. The project, 'Where East meets West', will be a collaboration between the University of Leeds and the East Africa regional climate prediction centre, ICPAC.

OUR PARTNERSHIPS

Updates and new information from our six partners: Centre for Polar Observation and Modelling (CPOM), Institute of Meteorology and Climate Research (IMK) at Karlsruhe Institute of Technology (KIT), Met Office, National Centre for Atmospheric Science (NCAS) and National Centre for Earth Observation (NCEO).

CPOM

This winter saw CPOM Leeds travelling to the Antarctic to collect valuable information that will help improve measurements of sea and land ice made by satellites such as the European Space Agency (ESA) CryoSat-2 mission.

First to venture south was sea ice researcher **Rachel Tilling**, who spent the Antarctic summer and festive season aboard the RRS Ernest Shackleton. Aided by CPOM Bristol PhD student Isabel Nias, Rachel collected ground penetrating radar and electromagnetic measurements of snowfall accumulating on sea ice in Antarctica's Weddell Sea.

This "snow load" affects how the well the satellite radar can penetrate down to the ice, and therefore how accurate measurements of ice thickness are. Normally, Antarctic sea ice has about 30cm of snow cover, but on land-fast ice attached to the shore it can reach depths of over 2m.

Photo: Rachel investigating a snow pit on land-fast ice

Rachel now hopes to use the data to create new, robust sea ice thickness maps for the region which take into account the effects of snow loading on the satellite radar data.

Meanwhile, CPOM Director **Andy Shepherd**, Independent Research Fellow **Anna Hogg** and PhD student **Adriano Lemos** took part in the ESA CryoVEx/KAREN campaign, which is collecting airborne and ground-based measurements to compare how the different radars on CryoSat and the French-Indian Altika satellite mission penetrate the snow overlying the ice sheet. Travelling to Western Palmer land on the Antarctic Peninsula, they took ice core samples at several sites directly under CryoSat's orbital path which can now be compared with the satellite as well as airborne measurements.

The ice cores revealed melt layers in the snow, which again affect how far CryoSat's radar can penetrate. In years where the snow melts and refreezes, new ice layers can form above the ice sheet's actual surface: this was seen in the Arctic in 2012, when the whole of Greenland experienced melting and CryoSat's measurements suggested a 0.5m increase in ice elevation. In fact, the radar scattering horizon was nearer the surface due to the band of ice which had formed in the snow.

Campaigns like these are vital to investigating new and better ways of observing the changing polar environments from space. Back in the UK, the CPOM team is now analysing the data to extract what we hope will be some really exciting and important science results.

Photo: (Bottom left) Andy and Anna collecting ice cores from Antarctica's Western Palmer Land for the ESA CryoVex/KAREN campaign. Credit: CPOM.

Photo: (Front page) View of sea ice from the RRS Ernest Shackleton. Credit: CPOM.

IMK, Karlsruhe Institute of Technology

ICAS and the Institute of Meteorology and Climate Research (IMK, Karlsruhe Institute of Technology) are two of Europe's largest and most-renowned research organisations for atmospheric science. ICAS and IMK share a common vision and research strategy, and have a long tradition of successful collaboration, particularly through international field campaigns and large European projects or research programmes, but also through the small-scale interaction of individual scientists. For example, in the area of "Dynamics and cloud processes in the troposphere" of the Helmholtz

OUR PARTNERSHIPS CONTIINUED...

Programme “Atmosphere and Climate” (2009-2012) led by KIT, more peer-reviewed scientific papers were published with scientists from the University of Leeds than with any other institution worldwide. In order to sustain and expand this successful collaboration, ICAS and IMK established a formal partnership in 2014. A few recent updates are mentioned here:

• Christian Grams was a KIT graduate, a visiting students at Leeds who then spent his postdoc years at ETH and has now returned to KIT. He has started a new working group at IMK with two postdoc and two PhD positions looking at weather regime changes in the mid-latitudes.

• HaPe Schmid is visiting Leeds and ICAS to give a Seminar on 22nd May on “Is Long-Term Ecosystem-Atmosphere Observation actually Science?”. Look out for further details to follow on the ICAS Seminar webpage.

Met Office

Professor Stephen Belcher, Chief Scientist for the Met Office visited the University and ICAS on the 1st February, meeting the VC and other senior staff to discuss the Partnership. Stephen also presented his seminar on ‘Climate Science following the Paris Agreement: what next?’ and heard from some of the Partnership’s early career researchers.

The Met Office – University of Leeds Joint Research Unit (JRU) has now been established, and will be formally launched in the coming months, with events planned both at Leeds and at the Met Office. The launch events will showcase the breadth of expertise and joint activities from across the partnership.

A warm welcome to **Dr Marcelo Galdos**, University Academic Fellow in Modelling Food Security and Climate Impacts who started in January. Marcelo joins the JRU as a Met Office University Academic Fellow, alongside Marta Bruno Soares who started in September as the Met Office UAF in Climate Services and Social Sciences. This brings the number of joint staff in the JRU to six.

The next MOGUL meeting will be held in the summer (dates to be finalised) and will focus on Air Quality.

The partnership which is led by **Professors Doug Parker and Paul Field** now boosts 6 joint and visiting Professorial positions, six posts within the JRU and 20+ joint PhD studentships, which is more than three times the pre-MOAP number. The partnership is also supported by 2 support posts; **Suzie May-Graham** who provides admin support and **Ruth Lawford-Rolfe** who leads on developing opportunities for impact and innovation.

NCAS

Leeds researchers help to investigate Saharan desert dust using the FAAM aircraft

A team of researchers led by Dr

Hannah Price, Facility for Airborne Atmospheric Measurements, have used a new technique to detect the concentration of ice-forming particles in desert dust over the Atlantic. There have been very few measurements of ice-forming particle concentrations in the atmosphere near to desert sources, and the Ice in Clouds Experiment Dust (ICE-D) campaign provided the perfect opportunity to find out more about these particles. The project brought together scientists from across NCAS and ICAS, and was part funded by **Prof Ben Murray**’s European Research Council fellowship which supported **Hannah Price, Jim McQuaid and Ben Murray** to make the INP measurements and write the paper.

NCAS will evaluate MeteoGroup forecasts for the BBC

NCAS have been engaged by the

BBC to monitor the accuracy of the new weather forecasts provided by MeteoGroup. **Stephen Mobbs and Maryna Lukach** will use observations from weather stations across the UK to carry out the evaluation.

GCRF African SWIFT project website now live

The NCAS-led project GCRF African SWIFT website is now online, containing information, opportunities and news updates from the project.

Atmospheric Science Conference 2018

NCAS and the Royal Meteorological Society are jointly hosting the first UK Atmospheric Science Conference, which will take place on Tuesday 3 and Wednesday 4 July 2018, at the University of York. The imminent abstract deadline is Thursday 29 March 2018. The meeting will be broadly based, bringing together atmospheric scientists with interests in weather, climate, and atmospheric chemistry to present latest research findings. Oral and poster contributions from all those communities are encouraged. Register & submit your abstract.

Discover more NCAS news at www.ncas.ac.uk and follow them on Twitter @AtmosScience

LIVING LAB FOR AIR QUALITY

Ever wondered how clean the air around University of Leeds campus is?

The Living Lab for Air Quality is a year-long monitoring project designed to help answer that question. The Living Lab has recruited student volunteers from across the University to carry out regular air pollution monitoring walks in set routes around campus, carrying state-of-the-art portable particulate matter air quality monitors. Staff and students might have noticed the blue circles appearing round campus? These are way-markers along the monitoring routes. The project started in November, and the first data is now online, displayed in an interactive web site designed by James O'Neil, CEMAC's new software development scientist (http://sustainability.leeds.ac.uk/the-living-lab/airquality/).

The Living Lab (http://sustainability.leeds.ac.uk/the-living-lab/) is a collaboration between the University of Leeds Sustainability Service (http://sustainability.leeds.ac.uk/), the School of Earth & Environment, the Institute for Climate & Atmospheric Science, the Institute for Transport Studies and the School of Civil Engineering. These maps of air pollution will be used, along with knowledge drawn from across the university, to design strategies to manage air pollution around campus. In the future the Living Lab will also be researching pollution exposure on our key staff and student commuter routes. Volunteers will carry monitoring equipment with them whilst they drive, cycle, walk or sit on public transport so that we can compare how much pollution we are exposed to using different routes and transport methods.

First results were presented at the University's Be Curious festival, where visitors were given a chance to see maps of air pollution, suggest strategies for reducing pollution, and test their knowledge in a global air quality quiz!

If staff, or any students, would like to volunteer to monitor for the Living Lab for Air Quality please contact Cat Scott (c.e.scott@leeds.ac.uk).

Photos: Credit: Cat Scott. (Top) Be Curious Festival 2018 visitors were presented first results using lego. (Bottom left) Maps presenting first results at Be Curious Festival 2018. (Bottom right) Kirsty Pringle carrying state-of-the-art portable particulate matter air quality monitor next to way-marker showing a monitoring route.

UPDATE FROM OUR CENTRE OF EXCELLENCE FOR MODELLING THE ATMOSPHERE AND CLIMATE (CEMAC)

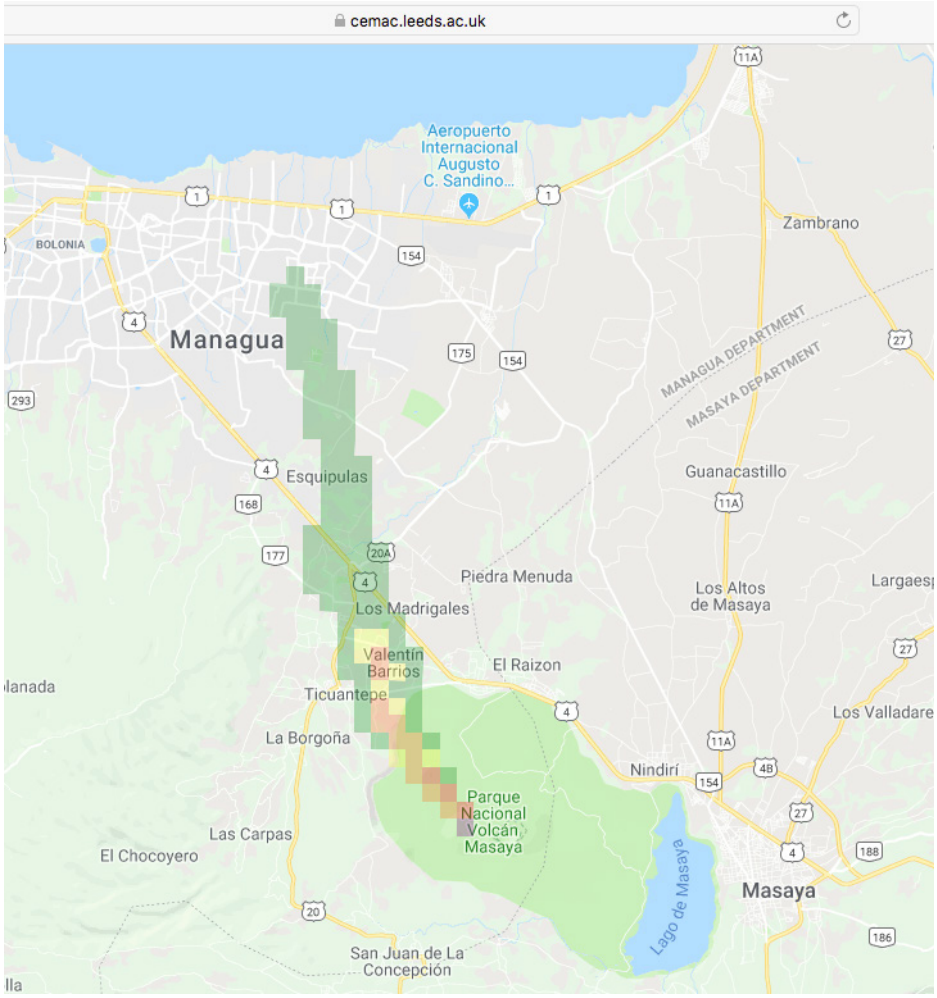
In January 2018, CEMAC moved into a new phase of activity with the arrival of our two new Software Development Scientists, **James O'Neill and Chris Dearden**. James and Chris bringing a wealth of skills and experience across various aspects of programming, code optimisation & development, high performance computing and numerical modelling. Their work over the past two months has already led to exciting benefits across eight science and outreach projects.

Work on the EU AfriCultuRes project, working with the GLAM crop model, has already led to significant model performance improvements. James' work on optimisation of memory management has resulted in a factor of 400 reduction in memory requirements for global GLAM simulations currently being run within the Climate Impacts group, with significant model speed-up. This development has led to a significant improvement in workflow for the GLAM modelling group, by allowing simulations on different platforms that were previously unfeasible. As part of the GCRF UNRESP project, James is establishing modelling tools for forecasting volcanic emission impacts on air quality in Nicaragua (see figure below). Ultimately, we will be developing an interactive dashboard for Nicaraguan Emergency Response agencies to monitor public risk associated with this phenomenon.

As an experienced user of weather and climate models, Chris is initially working on a joint project with the Met Office on optimisation of atmospheric chemistry routines in the UKCA model code. As part of this work, he will be undertaking extensive training in the latest UM model configuration, becoming our CEMAC UM technical expert. Alongside our Technical Head, **Mark Richardson** and with assistance from NCAS CMS and the University ARC team, he will also be setting up and managing the installation of the latest UM version 11.0 on the University ARC3 system.

For further information on current CEMAC projects, or how CEMAC can help with your research and projects, please contact **Mark Richardson or Steve Arnold**, or visit cemac.leeds.ac.uk.

Figure: Prototype web-based forecasting system for plume dispersion from the Masaya Volcano in Nicaragua, under development by CEMAC, jointly with the Icelandic Meteorological Office INITER (Nicaragua).



FEATURED PERSON: MAL MCMILLAN

What is your role in ICAS?

I'm currently an Associate Professor in Polar Satellite Geodesy within the Climate Change and Impacts Theme and the Polar Earth Observation Group.

What do you like the most about ICAS?

The research ethos and day-to-day vibrancy of the Institute.

Why did you choose this career and how did you get here?

Having done a degree in Maths and Philosophy, I wanted to move into a more applied field, and preferably one that fitted with my love of cold, remote and mountainous regions. I therefore did an MSc in Remote Sensing & Image Processing, with a dissertation studying Greenland supraglacial lakes. I really enjoyed the research aspects, intellectual challenge and freedom of postgrad study and so decided to continue on to a career in academia.

What scientific achievement are you most proud of?

Probably I'd have to say one of my early papers, which developed a new method of mapping ice shelf dynamics, because it was my first really creative and independent piece of science.

What does a typical working day involve for you?

It's pretty mixed, lots of emails, usually a project teleconference, collaborating with colleagues in CPOM or meeting students. If I'm lucky I try to make a bit of time for myself, coding on whatever my current personal project is.

What's the most interesting aspect of your job right now?

The current transition to a new era of operational high-resolution satellites makes it a really interesting time to be working in my field, with lots of opportunities on the horizon. Also, we currently have a new satellite - Sentinel-3 - to play with, and being involved at the early stages of a new mission is always exciting. Nothing beats processing data for the first time, retrieving signals of ice sheet change, and knowing you're probably the only one in the world who's done it.

What's the most challenging aspect of your job?

For me, the biggest challenge at present is to get better at managing the multiple competing demands on my time, and to make sure that I prioritise and balance workload effectively.

How do you decompress outside work?

On a day-to-day basis fell running mostly, plus when I have the chance trips to wild and remote places.

What bit of information about you is likely to surprise your colleagues?

I am a qualified ski instructor, and love ski touring in remote snowy places, including Greenland, Antarctica, Japan, New Zealand and Canada.

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