



ICAS Newsletter

Issue 10
July 2017



Institute for Climate and Atmospheric Science

SCHOOL OF EARTH AND ENVIRONMENT

STOP PRESS: GLOBAL CHALLENGES RESEARCH FUND SUCCESS

Professor Alan Blyth of National Centre for Atmospheric Science and ICAS and Professor Doug Parker (ICAS) will lead a Global Challenges Research Fund RCUK funded project called GCRF African Science for Weather Information and Forecasting Techniques (GCRF African SWIFT).

GCRF African SWIFT was awarded £7.8m with the ambition that African forecasting capabilities will improve on hourly and seasonal timescales, and that a lasting research infrastructure will be put in place that translates benefits to the wider developing world.

Full details will follow in November issue.

INSIDE THIS ISSUE

OUTREACH: BBC TERRIFIC SCIENCE, ROYAL SOCIETY SUMMER SCIENCE EXHIBITION

FEATURED PAPERS:
ANTARCTIC PENINSULA ICE MORE STABLE THAN THOUGHT,
ANTARCTICA MAJOR DRIVER IN PAST OCEAN CHANGES
GAS THREATENS HEALING OF HOLE IN OZONE LAYER,
VOLCANIC 'PLUMERANG' COULD IMPACT HUMAN HEALTH.

ICASP PROGRAMME LAUNCHED TO DELIVER RESEARCH IMPACT

THE CLOUD-MOTION MARIE CURIE INNOVATIVE TRAINING NETWORK

ICAS ANNUAL SCIENCE MEETING NOVEMBER 2016

FEATURED PERSON: RICHARD POPE

OUTREACH: TERRIFIC SCIENCE AT THE GREAT YORKSHIRE SHOW

Tornadoes in a bottle and volcanoes erupting bicarbonate of soda “lava” proved popular at The Great Yorkshire Show, where they gave ICAS researchers an opportunity to talk about science.

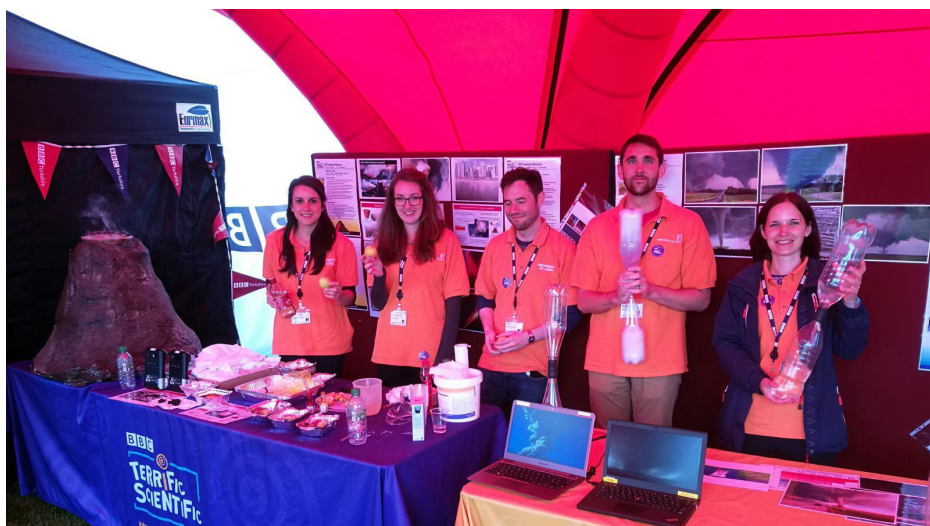
A team of 10 ICAS researchers, both students and staff, took part... in the Great Yorkshire Show 11-13 July with BBC Yorkshire. Jane Chesworth, Regional Broadcast Coordinator, contacted **Dr Lindsay Bennett** to see if she would be interested in running some Terrific Scientific demonstrations in the BBC marquee. Jane visited the School during the Festival of Science to see the various demos in the Weather and Water workshop and discuss options. We decided the experiments that would work best were the “Lemon Volcano”, supported by “the big volcano” alongside (a papier mâché prop made for the NERC Into the Blue event last year), and “Tornado in a Bottle”. With **Kirsty Pringle**’s help, a team of eager volunteers were gathered to help deliver the event.

The BBC marquee had a variety of activities including a silver screen for visitors to have a go at presenting the weather, as well as a radio drama kit for making a 5-minute Archers-type programme. Paddington Bear, Danger Mouse and several Look North Weather presenters also made appearances.



The science demos were very well received by the public and the ICAS team did a fantastic job engaging with crowds of school children as well as older generations. 400 lemons were used over the course of the three days. Even the constant

rain on day 1 (not forecasted by Paul Hudson!) couldn't dampen the Yorkshire Show spirit. Luckily though the sun shone for days 2 and 3 and record numbers of visitors attended the Show.



The researchers, who were demonstrating the experiments with nothing more technical than pop bottles, lemons and other household items, were interviewed by BBC Radio Humberside presenting live from the show and Paul Hudson for The Weather Show on BBC Radio Leeds and BBC Radio Lincolnshire (16 July, repeated 17 July 2017).

In between stirring up the tornadoes, Lindsay, an NCAS Instrument Scientist and ICAS member who runs the Centre's mobile X-band radar, talked about the versatility of the trailer-based radar, which

OUTREACH: TERRIFIC SCIENCE...continued



has been taken to places ranging from Cape Verde to Scotland to study clouds, and also spoke about her own close encounters with tornadoes in the USA.

Dr Cat Scott, who was in charge of the mini volcanoes, also talked to Paul Hudson about her involvement with the European Crescendo project examining the next generation of climate models, as well as her own research into how gases from trees and vegetation participate in the atmosphere.

Well done and thanks to all that helped out for their hard work:

Master students: Jay Broccolo, Freya Lumb, Martin Daily.

PhD Students: Anne Barber, Lauren Marshall, Sarah Shallcross.

Staff: Cat Scott, Carly Reddington, Kirsty Pringle, Lindsay Bennett

Listen to the interviews here:
To see demos of the experiments at Terrific Scientific, go here for lemon volcanoes:

<http://www.bbc.co.uk/guides/zwfx3k7> and all demos here: <http://www.bbc.co.uk/>

terrificscientific.com

Photos: Previous page (top): Lauren Marshall and Martin Dailey with papier mache volcano! Credit: Lindsay Bennett.

Previous page (bottom) & front page: L-R Cat Scott, Lauren Marshall, Martin Daily, Jay Broccolo and Lindsay Bennett man the stand. Credit: Lindsay Bennett.

This page (top): Cat Scott and Lindsay Bennett with Paul Hudson from BBC The Weather Show. Credit: Lindsay Bennett.

OUTREACH: ON THE RADIO

Hana Pearce and Kirsty Pringle were on East Leeds FM on their monthly science radio podcast (details below). Kirsty was talking about The Air in Saltaire <https://theairinsaltire.wordpress.com/> and Hana was talking about a Sense about Science campaign called Haven't the Foggiest <http://senseaboutscience.org/activities/havent-the-foggiest>. They also discussed the science of weather, and air pollution caused by particulate matter suspended in the atmosphere.

In case you missed it you can listen here:
<http://www.chapelfm.co.uk/listen-again/science-matters-understanding-the-weather-and-air-pollution/>

GOODBYE & GOOD LUCK TO ANJA SCHMIDT

Anja Schmidt will be leaving Leeds in September to take up a lectureship at Cambridge.

We are extremely proud and happy to see how Anja has progressed from a PhD student (and formerly an Erasmus student) to a world-recognised academic in volcanism and climate.

She has made outstanding contributions to the ICAS and the School of Earth and Environment through her research, her impact studies, her collegiate spirit and ambition.

I'm sure everyone will wish to join us in wishing Anja all the best for the future.

OUTREACH: ROYAL SOCIETY SUMMER SCIENCE EXHIBITION

ICAS were well represented at this year's Royal Society Summer Science Exhibition in London from 3rd - 9th of July.

Carly Reddington, Chris Wilson, Lauren Marshall, Richard Pope and Cat Scott all went along to assist with the "A Model Earth" stand, a joint effort from the UK's Earth System Model (UKESM) team, the CRESCENDO project, the Met Office, NCAS, NCEO and several UK universities.

Visitors to the stand had the opportunity to build their own model Earth, see visualisations on a touch screen globe and take part in a climate change quiz.

A wide range of people attended the exhibition including school groups, families, college and university students, and other interested adults; during special evening sessions, the event was closed to the public so that Fellows of the Royal Society could visit and grill the exhibitors on their topic!

"The global animation was a great success promoting interest from many visitors. There were many shocked faces when they saw the future temperature trends



Photos: Top - Visitors to the stand were challenged to build their own model earth – a race against the clock!

Bottom L-Richard Pope (right) explains the pattern of carbon dioxide concentrations in the atmosphere.

Bottom R - Preparing to meet the Royal Society Fellows at the evening soiree [L-R: Alberto Munoz (UKESM Project Manager), Cat Scott (ICAS), Jeremy Walton (UKESM Software Engineer). Credit: Cat Scott.

and simulated plumes of CO₂/CO pollution from places like China and the US. However, the climate quiz was the runaway winner with dozens of kids wanting to play and keen to learn: UKESM objectives achieved!" said **Dr Richard Pope**.



FUNDING SUCCESS

Andy Dougill, Anne Tallontire (both SRI) & **John Marsham** (ICAS) have been awarded £99k for a NERC/DFID funded Future Climate for Africa Applied Research Fund project on “Climate Information for Resilient Tea Production”. The project includes partners from the Met Office, Ethical Tea Partnership, UTZ, James Finlay Limited, Tea Research Foundation of Central Africa, Kulima IDS & Universities in both Malawi and Kenya. It will identify planning priorities & explore the potential for landscape-scale adaptations to support climate-resilient planning in tea production & supply chains in both countries.

Prof. Doug Parker and **Rory Fitzpatrick** have been awarded a Leeds University Research Mobility Award grant to investigate dynamical differences in convection-permitting climate simulations with the Jackson School of Geoscience in Austin Texas from July until September this year.

Cat Scott, **Kirsty Pringle**, **Jim McQuaid** and **Steve Arnold** have been awarded a NERC public engagement grant, together with researchers at the Universities of York and Sheffield, for an air quality awareness project “Making the Invisible Visible”.

Andy Challinor is part of successful H2020 bid called AfriCultuReS – Enhancing Food Security in AFRiCAn AgriCULTUral Systems with the Support of REmote Sensing. It aims to design, implement and demonstrate an integrated agricultural monitoring and early warning system that will support decision making in the field of food security. It will deliver a broad range of climatic, production, biophysical and economic information, for various regions in Africa. AfriCultuReS will apply geospatial science to sustainable agricultural development, natural resource management, biodiversity conservation, and poverty alleviation in Africa.

FUNDING SUCCESS

The CLOUD-MOTION Marie Curie Innovative Training Network

The CERN CLOUD project has been running for nearly a decade and has made a string of fundamental discoveries related to the formation of atmospheric aerosol particles. The project has now been awarded an unprecedented third EU Marie Skłodowska-Curie European Training Network, called CLOUD-MOTION (CLOUD-MObility, Training and InnOvation Network). The project will fund twelve PhD students around Europe and at CERN and is led by Goethe University Frankfurt. Leeds will host two PhD students working on aerosol modelling, led by Ken Carslaw.



CLOUD-MOTION follows the two previous projects CLOUD-ITN, which funded Eimear Dunne, and CLOUD-TRAIN, which funded Kamalika Sengupta. These two projects led to the first global model of aerosol formation based on laboratory data (Dunne et al., 2016) and the discovery of how biogenic emissions could substantially affect new particle formation and climate (Kirkby et al., 2016; Gordon et al., 2016).

CLOUD-MOTION explores a whole new range of atmospheric environments where the formation of new particles is likely to influence air quality and climate, such as marine, Arctic and heavily polluted environments. Leeds will continue to explore the implications of new discoveries for global aerosol and climate and will also investigate aerosol formation and growth processes in complex cloudy environments using high-resolution models.

For more information about CLOUD, see <https://home.cern/about/experiments/cloud> and http://www.cloud-train.eu/About_CLOUD-TRAIN.html

Dunne EM et al. Global atmospheric particle formation from CERN CLOUD measurements, *Science*, 354, doi: [10.1126/science.aaf2649](https://doi.org/10.1126/science.aaf2649) (2016).

Gordon H, Sengupta K et al. Reduced anthropogenic aerosol radiative forcing caused by biogenic new particle formation, *Proceedings of the National Academy of Sciences*, 113, doi: [10.1073/pnas.1602360113](https://doi.org/10.1073/pnas.1602360113) (2016).

PROJECT NEWS: iCASP LAUNCHED TO DELIVER RESEARCH IMPACT



The Yorkshire Integrated Catchment Solutions Programme (iCASP) has been launched at an invited assembly of 100 stakeholders on July 5th.

Funding from the Natural Environment Research Council for the five-year regional impact programme was announced last November and attracted media interest which headlined the programme's aim to realise £50 million of regional benefits from the application of existing environmental science.

Although the first wave of publicity focused on what could be done to ameliorate flooding and droughts, the actual focus of the programme is wider. It has potential to deliver benefits through enhanced climate resilience, carbon storage, improved water quality, more productive soils.

There will be opportunities for academics from many different specialisms to pool their expertise

in projects co-designed with stakeholders to apply environmental science to wide-scale catchment management challenges.

iCASP's first project met with widespread approval at the launch event, perhaps because so many key partners in the programme will benefit. Led by Professor Suraje Dessai, the UKCP18 Demonstrator Project will help organisations in Yorkshire to prepare for the publication of the new UK Climate Projections next year.

Many organisations such as water companies and local authorities who use climate data to inform long-term decisions came to the launch and will be collaborating in workshops designed to improve the communication of climate data so that it can be operationalised more easily. They will also learn about some significant changes since the last set of climate projections was published in 2009.

Outputs from this first iCASP project will feed directly into the approach used by another of the programme's Springboard partners, the Met Office, which is responsible for preparing the projections for dissemination. Further projects, large and small, will take shape this autumn through a series of workshops and meetings that the iCASP team led by Programme

Manager, Rob Munroe, is currently formulating.

An exercise to identify the research relevant to the topics covered by iCASP is currently being conducted by the iCASP team together with academics such as ICAS Professors Alan Blyth and Piers Forster (for flood forecasting and climate resilience respectively).

This will be used to inform these workshops and meetings. An Impact Officer, Finn Barlow-Duncan and two full-time Impact Translation Fellows, Dr Janet Richardson and Dr Ben Rabb have been appointed to facilitate the process by which research knowledge becomes accessible and useable to meet specific user needs. iCASP's aspirations are that by the end of five years the programme will have helped to develop an innovative joined-up approach to land and water management that can be used elsewhere in the UK and internationally.

<http://www.environment.leeds.ac.uk/research/yorkshire-icasp/>

Photos: Credit: iCASP. Top: iCASP is a 5 year NERC funded regional impact programme. Bottom: Delegates from a range of organisations undertake round table discussions.



FEATURED PAPER: ANTARCTIC PENINSULA ICE MORE STABLE THAN THOUGHT

Glacier flow at the southern Antarctic Peninsula has increased since the 1990s, but a new study has found the change to be only a third of what was recently reported.

An international team of researchers, led by the UK Centre for Polar Observation and Modelling at the Institute for Climate and Atmospheric Science are the first to map the change in ice speed. The team collated measurements recorded by five different satellites to track changes in the speed of more than 30 glaciers since 1992.

The findings, published in *Geophysical Research Letters*, represent the first detailed assessment of changing glacier flow in Western Palmer Land — the southwestern corner of the Antarctic Peninsula.

The new Leeds led research calls into question a recent study from the University of Bristol that reported 45 cubic kilometres per year increase in ice loss from the sector. The Leeds research found the increase to be three times smaller.

Lead author **Dr Anna Hogg**, from the Institute of Climate and Atmospheric Science, said: “Dramatic changes have been reported in this part of Antarctica, so we took a closer look at how its glaciers have evolved using 25 years of satellite measurements dating back to the early 1990s.”

The researchers found that between 1992 and 2016, the flow of most of the region’s glaciers increased by between 20 and 30 centimetres per day, equating to an average 13% speedup across the glaciers of Western Palmer Land as a whole.

These measurements provide the first direct evidence that Western Palmer Land is losing ice due to increased glacier flow — a process known as dynamical imbalance.

The team also combined their satellite observations with an ice flow model using data assimilation to fill in gaps where the satellites were unable to produce measurements. This allowed the complete pattern of ice flow to be mapped, revealing that the regions glaciers are now pouring an additional 15 cubic kilometres of ice into the oceans each year compared to the 1990s.

The earlier study reported that the region was losing three times this amount of ice, based on measurements of glacier thinning and mass loss determined from other satellite measurements. The



A view from the British Antarctic Survey (BAS) Rothera research station, on Alexander Island at the Antarctic Peninsula. Credit: A. E. Hogg/CPOM

FEATURED PAPER: ANTARCTIC PENINSULA ICE MORE STABLE THAN THOUGHT... continued

Leeds study casts doubt on that interpretation, because the degree of glacier speedup is far too small.

Study co-author **Professor Andrew Shepherd**, also from ICAS, explained: "Although Western Palmer Land holds a lot of ice - enough to raise global sea levels by 20 centimetres - its glaciers can't be responsible for a major contribution to sea level rise, because their speed has barely changed over the past 25 years. It's possible that it has snowed less in this part of Antarctica in recent years - that would also cause the glaciers to thin and lose mass, but it's not a signal of dynamical imbalance."

The greatest speedup in flow was observed at glaciers that were

grounded at depths more than 300 m below the ocean surface.

Dr Hogg said: "We looked at water temperatures in front of the glaciers which have sped up the most, and we found that they flow through deep bedrock channels into the warmest layer of the ocean. This circumpolar deep water, which is relatively warm and salty compared to other parts of the Southern Ocean, has warmed and shoaled in recent decades, and can melt ice at the base of glaciers which reduces friction and allows them to flow more freely.

With much of Western Palmer Land's ice mass lying well below sea level it is important to monitor how remote areas such as this, are responding to climate change.

Satellites are the perfect tool to do this."

Pierre Potin, ESA's Manager of the Copernicus Sentinel-1 Mission which was used in the study, said: "We will continue to use Sentinel-1's all weather, day-night imaging capability to extend the long term climate data record from European satellites."

Paper reference:

Hogg, A. E., et al. (2017), Increased ice flow in Western Palmer Land linked to ocean melting, *Geophys. Res. Lett.*, 44, DOI:10.1002/2016GL072110

FEATURED PAPER: ANTARCTICA MAJOR DRIVER IN PAST OCEAN CHANGES

A new study published recently in *Nature Communications* highlights the importance of Antarctic ice sheet advance in causing changes in the Pacific Ocean during the descent into the ice ages, at the Plio-Pleistocene Transition (3.2 to 2.6 million years ago).

One of the dominant changes occurring during this transition was the shift to large ice sheets in the Northern Hemisphere.

However, the ocean was also undergoing significant changes. Using global climate models set up to simulate past environments, researchers in the Institute of Climate and Atmospheric Science and Earth Surface Science Institute showed that there is a link between ice presence in the Pacific sector of Antarctic and the formation of modern North Pacific Deep Water.

Dr Daniel Hill, the lead author

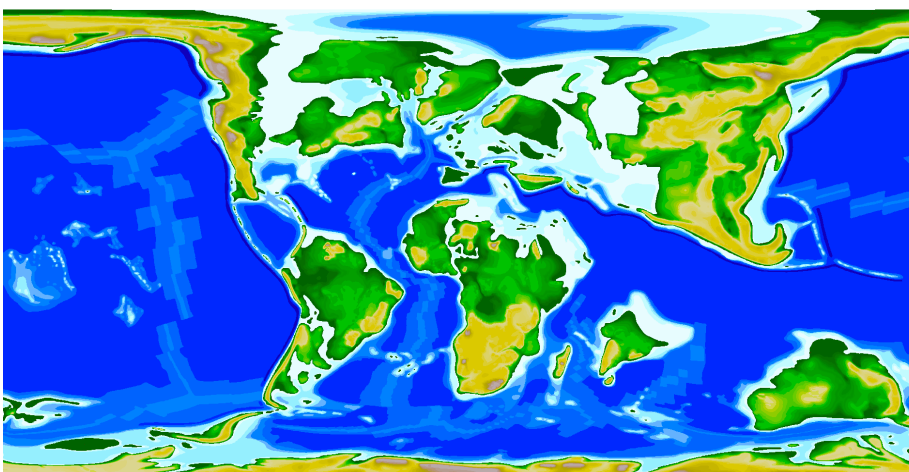
of the study says that they have demonstrated for the first time that ice advance after a warm period in the Pliocene is the main reason that Pacific Ocean deep water circulation increased during this time.

This study also highlights the success and potential for our NERC Research Experience Placements within the School of Earth and Environment.

Kevin Bolton, a co-author on the study, analyzed the multi-model component of the study as part of his NERC Research Experience Placement within the School.

Kevin has now gone on to study for a PhD at Environment and Sustainability Institute, College of Engineering, Mathematics and Physical Sciences, University of Exeter.

Image: Digital Elevation Model (DEM) for the Maastrichtian Stage of the Late Cretaceous ~66 million years ago. Credit: Markwick and Valdes, 2004.



FEATURED PAPER: GAS THREATENS HEALING OF HOLE IN OZONE LAYER

Atmospheric dichloromethane levels have started rising rapidly in the last few years, threatening to cause further destruction of the ozone layer. The ozone layer protects the earth from damaging solar ultraviolet radiation, thereby protecting animals, plants and humans.

Research led by ICAS and Lancaster University, along with the University of Cambridge and the US National Oceanic and Atmospheric Administration, discovered that although dichloromethane has a short atmospheric lifetime the sharp rise in its emissions could delay the expected recovery of the ozone layer due to the Montreal Protocol. The Montreal Protocol was signed in 1987 to ban numerous substances including CFC gases which lead to ozone destruction – most notably in the Antarctic Ozone Hole. The chemical dichloromethane is used as a solvent and as a feedstock for production of other chemicals. Not much is known about the why there is a sudden rise in the chemical but Ryan Hossaini (former ICAS Research Fellow and PhD graduate), lead author of the study in Nature Communications, is hopeful that by identifying the problem the damage can be slowed enough to only delay healing of the hole by 5 years.

Professor Martyn Chipperfield, second author said of the research “This increase in dichloromethane will not change the overall picture of ozone layer recovery, but could delay the process. It is important that we now work out the sources of these large emissions. We plan to start that work through a new NERC-funded project soon.”

<http://www.nature.com/articles/ncomms15962>

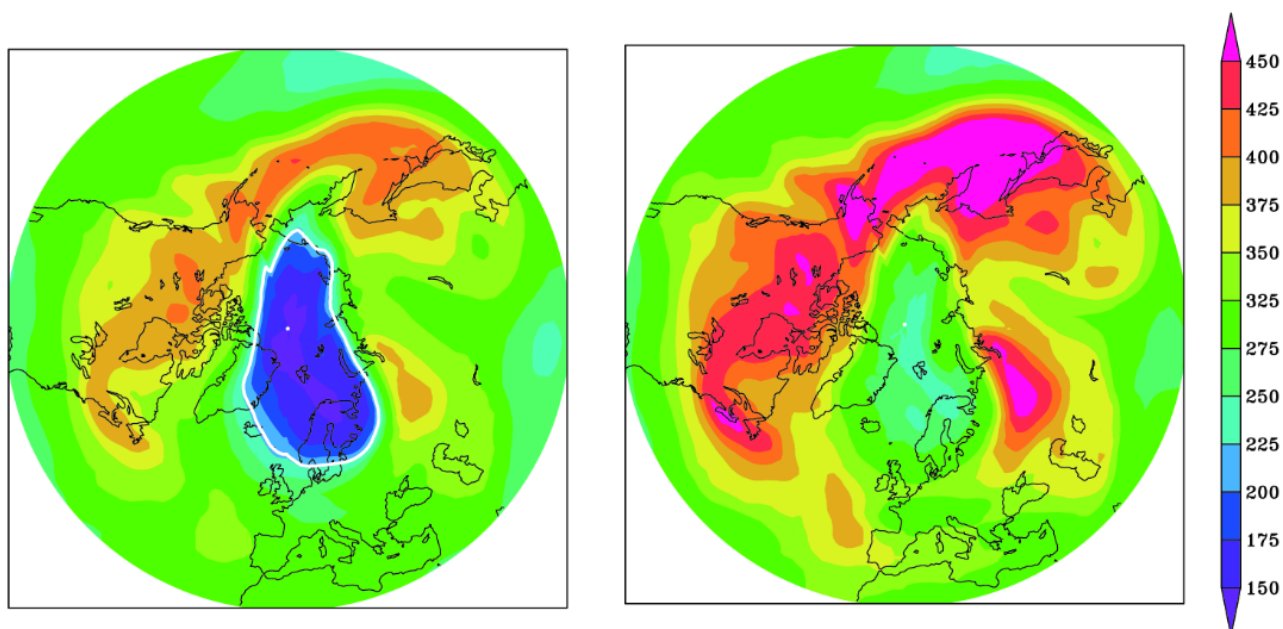


Image: Arctic ozone without the Montreal Protocol -left and following its implementation -right on 26 March 2011. Credit- Sandip Dhomse.

FEATURED PAPER: VOLCANIC ‘PLUMERANG’ COULD IMPACT HUMAN HEALTH

A new study led by researchers in the School of Earth and Environment has found a previously undetected potential health risk from the high concentration of small particles found in a boomerang-like return of a volcanic plume.

Dr Evgenia Ilyinskaya from the Institute of Geophysics and Tectonics, alongside a team of scientists from the UK and Iceland, traced the evolution of the plume chemistry from the 2014-2015 Icelandic Holuhraun lava field eruption and found a second type of plume that impacts air quality.

This second plume had circled back to Icelandic cities and towns long after the health warning about the initial plume had been lifted.

Lead author, Dr Ilyinskaya said: “The return of this second, mature, plume, which we referred to as a ‘plumerang’, showed that the volcanic sulphur had undergone a gas-to-particle conversion by spending time in the atmosphere. This conversion meant that the sulphur dioxide (SO₂) levels of the plumerang were reduced and within the European Commission air quality standards and therefore there were no health advisory messages in place.

“However, our samples showed that the mature plume was instead very rich in fine particles which contained high concentrations of sulphuric acid and trace metals. The concentrations of these trace metals did not reduce as the plume matured and included heavy metals found in human-made air pollution that are linked to negative health effects.

“On at least 18 days during the 6-month long eruption the plumerang was in the capital city of Reykjavík, while the official forecast showed ‘no plume’.”

The fine particles found in the plumerang are so small they can penetrate deep into the lungs, potentially causing serious health problems such as exacerbating asthma attacks.

It is estimated that short and long-term exposure to this type of fine particles, from both human-made and natural sources, cause over three million premature deaths globally per year and remains the single largest environmental health risk in Europe.

Dr Ilyinskaya is currently researching the possible health

impacts of the plumerang in collaboration with the University of Iceland. However there is already anecdotal evidence suggesting adverse effects.

Dr Ilyinskaya said: “We spoke to people living in Reykjavik who described a burning sensation in the throat and eyes when the SO₂ levels would have been well within air quality standards but the particle-rich plumerang would have been over the city.”

During the six-month-long eruption, the Icelandic Meteorological Office’s daily forecasts of the plume dispersion accounted only for SO₂ concentrations in the young plume. The mature plume was not forecast as part of volcanic air pollution monitoring.

The study, published in Earth and Planetary Science Letters, recommends that in future gas-rich eruptions both the young and mature plumes should be considered when forecasting air pollution and the dispersion and transport pattern of the plume.

Co-author **Dr Anja Schmidt**, from the Institute for Climate and Atmospheric Science said: “The Holuhraun eruption caused one of the most intense and widespread volcanogenic air pollution events in centuries. It’s estimated that the amount of sulphur dioxide released into the atmosphere was roughly two times that of a yearly total of SO₂ emissions generated by the European Economic area.

“It gave us a rare opportunity to study volcanism of this style and scale using modern scientific techniques. The data we have gathered will be invaluable to preparing for a potential future event and its impacts on air quality and human health.”

Photo: Evgenia and team flying over Holuhraun Credit: Evgenia Ilyinskaya



FEATURED PAPER: INCREASE IN EXTREME WEST AFRICAN STORMS DUE TO GLOBAL WARMING

Global warming is responsible for tripling the frequency of extreme West African Sahel storms over the last three decades putting numerous cities in the region at risk, say scientists.

An international team, including **Professor Parker** from the Institute for Climate and Atmospheric Science, have analysed weather trends from 35 years of satellite observations across Africa. Their findings, published in *Nature*, suggest that the power and frequency of intense storms in the Sahel is linked to the increasingly hot conditions in the Sahara desert caused by global warming.

The study estimates that climate change will cause the Sahel, a band of semi-arid land to the south of the Sahara desert, to experience more instances of extreme rain in future.

Professor Douglas Parker said: "African storms are highly organised meteorological engines, whose currents extract water from the air to produce torrential rain.

"We have seen these engines become more active over recent decades, resulting in increases in hazardous events in a region that is home to some of the most vulnerable people on the planet."

The Sahel zone in Africa is a region of sharp contrasts, from hot dry conditions over the Sahara in the north, to cooler, moister conditions in the south. When the temperature of the Sahara increases, the temperature contrast between the two regions causes significant changes in the African Easterly Jet - an airstream which organises and steers the weather systems in the region.

The study found warmer temperatures in the Sahara were associated with the African Easterly Jet becoming stronger and the regional weather systems getting more intense.



The changing dynamics of the weather systems, forced by the Saharan warming, is extracting more water from the atmosphere leading to extreme Sahelian storms.

The intense Sahelian storms, also referred to as Mesoscale Convective Systems (MCSs), are some of the most explosive storms in the world, containing clouds that can rise 16km above the ground.

The increase in frequency of Sahel storms has put many West African cities at risk of frequent severe flooding, leading to displacement and the spread of disease due to poor sanitation.

In 2009 a MCS caused a downpour of over 260 millimetres over several hours, destroying more than 250 homes in Ouagadougou, Burkina Faso. More than 50 per cent of the city's territory was flooded, including the main hospital.

Lead author Dr Christopher Taylor, from the Centre for Ecology and Hydrology part of the Natural Environment Research Council said, "Global warming is expected to produce more intense storms, but we were shocked to see the speed of the changes taking place in this region of Africa."

Further details:

Professor Douglas Parker and Dr Christopher Taylor have been collaborating for 20 years on the study of African weather systems and climate. Their research along with the findings published in *Nature* was presented at the General Assembly of the European Geosciences Union in April.

The research was funded by the Department for International Development (DFID) and the Natural Environment Research Council (NERC) as part of the Future Climate for Africa programme under the African Monsoon Multidisciplinary Analysis 2050 (AMMA 2050) project

Professor Parker is also supported by a Royal Society Wolfson Research Merit Award.

Paper reference
Christopher M. Taylor, Danijel Belusic, Francois Guichard, Douglas J. Parker, Theo Vischel, Oliver Brock, Philip P. Harris, Serge Janicot, Cornelia Klein, Jeremy Panthou, 'Frequency of extreme Sahelian storms tripled since 1982 in satellite observations', *Nature*, published online 1800 GMT/1400 US Eastern Time, 27 April 2017.
[DOI: 10.1038/nature22069](https://doi.org/10.1038/nature22069)

FEATURED PERSON: RICHARD POPE

What is your role in ICAS?

Postdoctoral Researcher funded by the National Centre for Earth Observation (NCEO).

What do you like the most about ICAS?

I would say the people I work with and the working environment they create. People in department are always happy to help be it coding issues, interpreting plots or a general chat about the life outside the university.



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

Geography and Maths were my favourite subjects at school, so I went on to do a degree in Meteorology and Oceanography at the University of East Anglia. This then naturally led to me undertaking a PhD here in the department. 5 years on and here I still am now working on air quality and modelling.

What scientific achievement are you most proud of?

Probably completing my PhD. Like most people in the department, there is a lot of work involved doing the research, writing it up and passing the viva. So I was proud to finally get on the pass list a few years ago.

What does a typical working day involve for you?

Writing code, plotting data and writing papers.

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

Analysing trends in air pollutants over the Amazon.

What's the most challenging aspect of your job?

Probably trying to debug errors in model runs.

How do you decompress outside work?

I enjoy several activities such as cycling and racket sports, but probably walking the dog is my favourite pastime.

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

I've recently become a dad for the first time....Hughie is about 7 weeks old :).