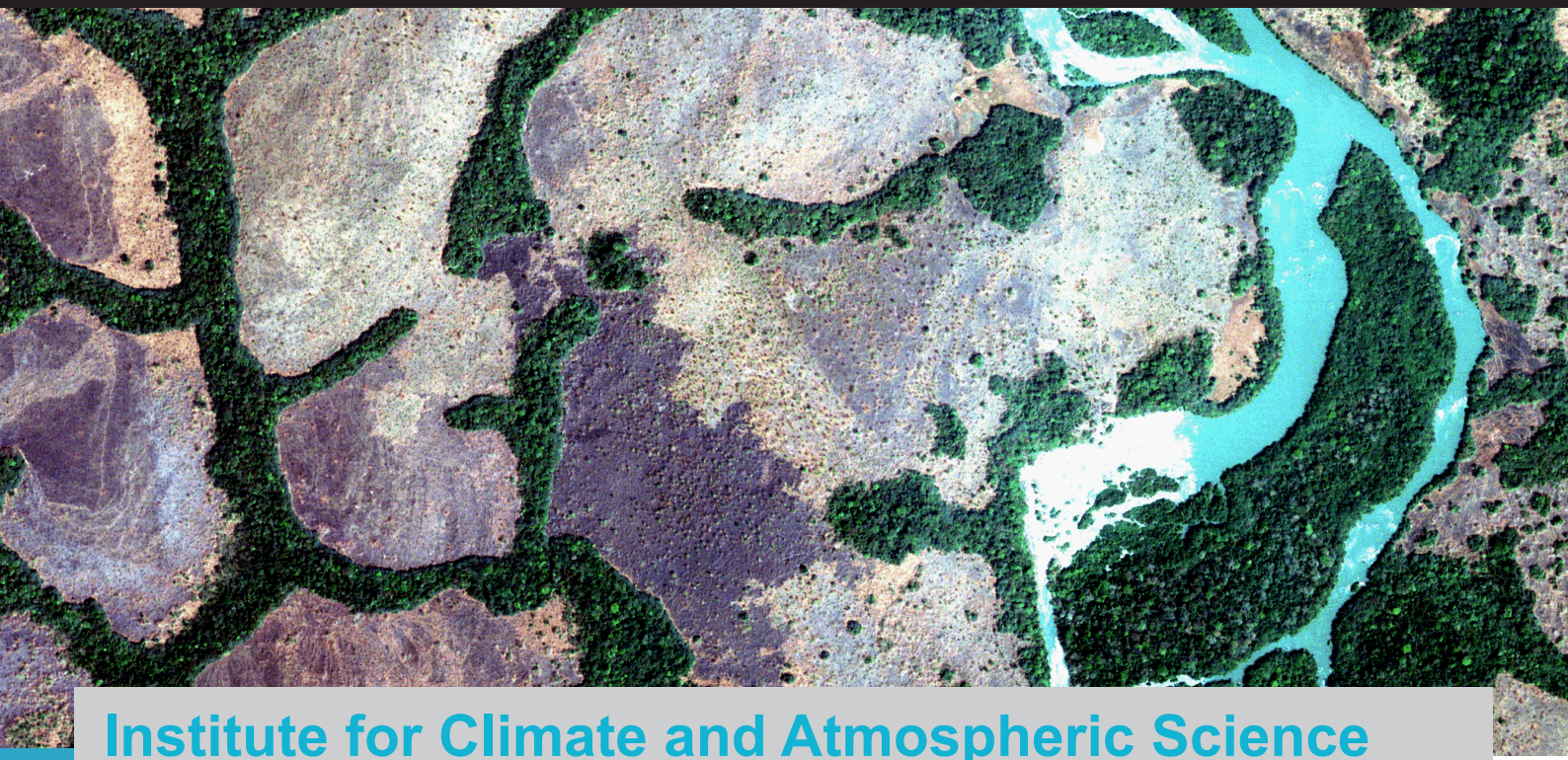
UNIVERSITY OF LEEDS

ICAS Newsletter

Issue 17
April 2020



Institute for Climate and Atmospheric Science

SCHOOL OF EARTH & ENVIRONMENT https://environment.leeds.ac.uk/institute-climate-atmospheric-science

DIRECTOR'S STATEMENT

Welcome to the latest edition of the ICAS Newsletter. This has been compiled a few weeks into the lockdown as we all work remotely due to the coronavirus pandemic. Our priorities are to stay safe, keep physically and mentally healthy and to look after families and friends. In addition, we are getting used to a new way of working. Science is a collaborative discipline so this change in situation represents a significant challenge, especially to the important creative side of our work, but I am sure that we can adapt. Conferences and fieldwork have been cancelled so we will have to wait and see what can be rearranged, and what the implications are for delays to projects. In the meantime we will have to get on and do those tasks which are possible from home (with the help of videoconferencing, of course).

This is my final Newsletter as ICAS Director. I have enjoyed doing the job and learning even more about the wide scope of ICAS work. I finish the role being even more impressed with our staff and students than when I started! I am pleased to say that from July 1st ICAS will be led by Amanda Maycock. I am sure that she will do a great job.
Martyn Chipperfield, Director

INSIDE THIS ISSUE

FEATURED PAPER: SIX-FOLD INCREASE IN POLAR ICE LOSSES SINCE THE 1990s

Image: An iceberg with melt point in the Bellingshausen Sea, Antarctica. Credit: Andy Shepherd.

Greenland and Antarctica are losing ice faster than in the 1990s and are both tracking the Intergovernmental Panel on Climate Change's worst-case climate warming scenario. As a result, this will lead to an extra 17 centimetres of sea level rise by 2100.

A team of 89 polar scientists from 50 international organisations have produced the most complete picture of polar ice sheet loss to date. The Ice Sheet Mass Balance Intercomparison Exercise (IMBIE) team combined 26 separate surveys to compute changes in the mass of the Greenland and Antarctic ice sheets between 1992 and 2018. Altogether, data from 11 different satellite missions were used, including measurements of the ice sheets' changing volume, flow and gravity.

The findings, published in two companion articles in Nature, show that Greenland and Antarctica lost 6.4 trillion tonnes of ice between 1992 and 2017 – pushing global sea levels up by 17.8 millimetres. Of the total sea level rise, 10.6 millimetres (60%) was due to Greenland ice losses and 7.2 millimetres (40%) was due to Antarctica.

"If Antarctica and Greenland continue to track the worst-case climate warming scenario, they will cause an extra 17 centimetres of sea level rise by the end of the century.", said ICAS Professor Andy Shepherd, IMBIE Co-Leader

The combined rate of ice loss has risen by a factor six in just three decades, up from 81 billion tonnes per year in the 1990s to 475 billion tonnes per year in the 2010s. This means that the polar ice sheets are now responsible for a third of all sea level rise. The assessment, led by Professor Andy Shepherd of ICAS and Dr Erik Ivins at NASA's Jet Propulsion Laboratory in California, was supported by the European Space Agency (ESA) and the US National Aeronautics and Space Administration (NASA).

In their Fifth Assessment Report, the Intergovernmental Panel on Climate Change (IPCC) predicted that global sea levels will rise 53 centimetres by 2100, and it is estimated that this would put 360 million people at risk of annual coastal flooding. However, the IMBIE Team's studies shows that ice losses from both Antarctica and Greenland are rising faster than expected, tracking the IPCC's worst-case ("high-end") climate warming scenario.

Andy Shepherd said: "Every centimetre of sea level rise leads to coastal flooding and coastal erosion, disrupting people's lives around the planet. If Antarctica and Greenland continue to track the worst-case climate warming scenario, they will cause an extra 17 centimetres of sea level rise by the end of the century. This would mean 400 million people are at risk of annual coastal flooding by 2100. These are not unlikely events with small impacts; they are already underway and will be devastating for coastal communities."

Almost all of the ice lost from Antarctica - and half of that lost from Greenland - has been triggered by oceans melting their outlet glaciers, which causes them to speed up. The remainder of Greenland's ice losses are due rising air temperature, which has melted the ice sheet at its surface. Combined losses from both ice sheets peaked at 552 billion tonnes per year in 2010 and averaged 475 billion tonnes per year for the remainder of the decade. The peak loss coincided with several years of intense surface melting in Greenland, and last summer's Arctic heatwave means that 2019 should set a new record for polar ice sheet loss. Antarctica and Greenland are now losing ice five and seven times faster than they were in the 1990s, respectively.

FEATURED PAPER: SIX-FOLD INCREASE IN POLAR ICE LOSSES SINCE THE 1990s CONTINUED...

Dr Ivins said: “Satellite observations of polar ice are essential for monitoring and predicting how climate change could affect ice losses and sea level rise. While computer simulation allows us to make projections from climate change scenarios, the satellite measurements provide prima facie, rather irrefutable, evidence. Our project is a great example of the importance of international collaboration to tackle problems that are global in scale.”

Guðfinna Aðalgeirsdóttir, Professor of Glaciology at the University of Iceland and lead author of the IPCC’s sixth assessment report, who was not involved in the study, said:
“The IMBIE Team’s reconciled estimate of Greenland and Antarctic ice loss is timely for the IPCC. Their satellite observations show that both melting and ice discharge from Greenland have increased since observations started. The ice caps in Iceland had similar reduction in ice loss in the last two years of their record, but summer 2019 was very warm in this region which resulted in higher mass loss. I would expect a similar increase in Greenland mass loss for 2019. It is very important to keep monitoring the big ice sheets to know how much they raise sea level every year.”

ESA’s Director of Earth Observation Programmes, Josef Aschbacher, comments: “The findings reported by IMBIE demonstrate the fundamental importance of using satellites to monitor the evolution of ice sheets, and for evaluating models used to predict the effects of climate change.”

Reference

Shepherd, A., Ivins, E., Rignot, E. et al. Mass balance of the Antarctic Ice Sheet from 1992 to 2017. Nature 558, 219–222 (2018). https://doi.org/10.1038/s41586-018-0179-y
Shepherd, A., Ivins, E., Rignot, E. et al. Mass balance of the Greenland Ice Sheet from 1992 to 2018. Nature 579, 233–239 (2020). https://doi.org/10.1038/s41586-019-1855-2

NEW SENSE EARTH OBSERVATION CENTRE FOR DOCTORAL TRAINING

In October 2020 ICAS will have four new PhD students, who were awarded studentships in the SENSE Earth Observation CDT - a new Centre for Doctoral Training based across Leeds and Edinburgh with a focus on Earth Observation.

SENSE aims to transform environmental science in the UK with data science and Earth Observation techniques. All students on this CDT will receive extensive training in Earth Observation, including atmosphere and cryosphere, as well as advanced data techniques such as machine learning.

Three of these students will be in ICAS, **Andy Challinor, Chris Wilson** and **Steve Arnold** and student will be in NCAS supervised by **Dan Grosvenor.** ICAS will also be involved in the supervision of SENSE students based in the National Oceanography Centre, Liverpool and at the British Antarctic Survey (BAS).

We look forward to welcoming them in October!

Image (right): Canadian Arctic Archipelga (contains modified Copernicus Sentinel data (2019), processed by ESA, **CC BY-SA 3.0 IGO**)

Image (front page): Quickbird © ESA 2007

FEATURED PAPER: THANKS TO CLOUDS, LATEST CLIMATE MODELS PREDICT MORE GLOBAL WARMING THAN THEIR PREDECESSORS

Researchers have found that the latest generation of global climate models predict more warming in response to increasing carbon dioxide than their predecessors. These refined models represent aspects of Earth's climate better than previous models, suggesting that these warmer predictions may be more realistic, but more study is needed to establish their reliability. The research, by scientists at Lawrence Livermore National Laboratory in collaboration with colleagues from the ICAS and Imperial College London, has been published in Geophysical Research Letters.

The researchers analysed the climate response to an abrupt increase of carbon dioxide in a collection of nearly 30 climate models from around the world. Rather than trying to simulate plausible emissions scenarios, these idealised experiments are designed for easily diagnosing climate sensitivity -- the global warming that occurs from a doubling of atmospheric carbon dioxide. The latest models have wide-ranging sensitivities, but taken as a whole, they warm more than their predecessors by about 0.5˚C. Many of them now have sensitivities exceeding 4.5˚C, which is outside the range previously deemed "likely" by the United Nation's Intergovernmental Panel on Climate Change (1.5 - 4.5˚C).

The primary culprits for the increased warming, the team discovered, were clouds.

"Clouds are Earth's sunscreen, reflecting away sunlight and keeping the planet cooler than it would otherwise be," explained Mark Zelinka, LLNL climate scientist and lead author of the study. If global warming leads to fewer or thinner clouds, it causes additional warming above and beyond that coming from carbon dioxide alone. In other words, an amplifying feedback to warming occurs. It is this amplifying cloud feedback that has strengthened in the latest models, according to the study. "These models are shedding their protective sunscreen in dramatic fashion, so they warm more in response to increasing carbon dioxide than their predecessors," Zelinka said.

In particular, the latest models predict a stronger decrease in cloud cover in the middle latitudes in response to warming. "The representation of clouds in this region is key to understanding the high climate sensitivity in these new models" said Daniel McCoy, ICAS coauthor.

At least one aspect of the latest models has improved: their mix of liquid droplets and ice crystals in clouds. For years, models have failed to match observations in maintaining abundant liquid water at temperatures well below freezing. The latest models are keeping more cloud water in this "super-cooled" liquid phase, an improvement that has previously been shown to increase climate sensitivity. The improvement in cloud phase is part of the story, at least for some models," noted Zelinka. "Taken alone, this improvement suggests that these highly sensitive models are giving us a more realistic view of future warming."

The researchers warn that a broader view is needed. "Some of the high sensitivity models have difficulty matching the observed global warming rate over the last few decades," added Stephen Po-Chedley, another LLNL co-author. "This might indicate that they are too sensitive to carbon dioxide increases. It remains to be established whether by improving certain aspects of the models, other imperfections have been introduced or unmasked."

Moving forward, scientists will continue to evaluate these latest models to shine a light on where they have improved and where they remain deficient. Zelinka added, "Only after fully vetting these models against the best available observations can we start making conclusions about whether we have more warming in store than we had originally thought."

Other LLNL researchers include Peter Caldwell, Stephen Klein and Karl Taylor. LLNL scientists collaborated with Daniel McCoy at ICAS and Paulo Ceppi at Imperial College London.

Reference:
Zelinka, M.D., T. A. Myers, **D. T. McCoy,** S. Po-Chedley, P. M. Caldwell, P. Ceppi, S. A. Klein, and K. E. Taylor, 2019: Causes of higher climate sensitivity in CMIP6 models, Geophys. Research Letters., doi: 10.1029/2019GL085782.

Image (left): Mammutus Cloud. Credit: Richard Johnson.

FEATURED PAPER: GREENHOUSE GAS NITROUS OXIDE IS ON THE RISE

During the last two decades agricultural practices and nitrogen-rich fertilisers have significantly increased the amount of nitrous oxide emissions in the atmosphere, according to a new study.
Nitrous oxide (N_2O) is one of the main stratospheric ozone depleting substances. It is also a long-lived greenhouse gas – along with carbon dioxide and methane – which contributes to global temperature rise.
An international team of scientists, including **Dr Chris Wilson** and **Professor Martyn Chipperfield** both from ICAS, has found that N_2O emissions have increased considerably during 1998-2016, but especially from 2009 onwards.

Their findings, published in Nature Climate Change, suggests that the steady rise of N_2O emissions in the atmosphere is strongly linked to an increase in nitrogen substrates released to the environment from agricultural practices.

Since the mid-20th century, the production of nitrogen fertilisers, widespread cultivation of nitrogen-fixing crops – such as clover, soybeans, alfalfa, lupins, and peanuts – and the combustion of fossil and biofuels have enormously increased the availability of nitrogen substrates in the environment.

Dr Chris Wilson from ICAS and National Centre for Earth Observation (NCEO) at Leeds said: "We already knew that atmospheric N_2O levels were increasing, but our study was able to assign this increase to specific regions and emission sources, which is important for informing strategies to limit the growth of this greenhouse gas."

Study lead author Dr Rona Thompson, from the Norwegian Institute for Air Research, said: "Our results suggest that reducing nitrogen fertiliser use in regions where there is already a large nitrogen surplus, will result in larger than proportional reductions in N_2O emissions. This is particularly relevant in regions such as East Asia, where nitrogen fertiliser could be used more efficiently, without reducing crop yields."

The study determined N_2O emissions from three global atmospheric inversion frameworks during 1998-2016, based on atmospheric N_2O observations from global networks. The findings suggest that the emission of N_2O has increased by a faster rate over the last decade than that estimated in the current Intergovernmental Panel on Climate Change (IPCC) guidelines.

The study found that between 2000-2005 and 2010-2015, N_2O emissions increased globally by roughly 1.6 teragrams of nitrogen per year, accounting for approximately 10% of the global total. This is about twice the amount reported to the United Nations Framework Convention on Climate Change based on the amount of nitrogen fertiliser and manure used and the default emission factor specified by the IPCC.

The authors suggest this discrepancy is due to an increase in the emission factor associated with a growing nitrogen surplus and the IPCC method, which assumes a constant emission factor, may underestimate emissions when the rate of nitrogen input and the nitrogen surplus are high. Co-author **Professor Martyn Chipperfied** also from the Institute for Climate & Atmospheric Science and NCEO, said: "The study highlights the need for more detailed algorithms and region-specific emission factors to estimate N_2O."

Reference:
Thompson, R.L., L. Lassaletta, P.K. Patra, C. Wilson, K.C. Wells, A. Gressent, E.N. Koffi, M.P. Chipperfield, W. Winiwarter, E.A. Davidson, H. Tian and J.G. Canadell, Acceleration of global N_2O emissions seen from two decades of atmospheric inversion, Nature Climate Change, 12, 993-998, 2019. doi:10.1038/s41558-019-0613-7

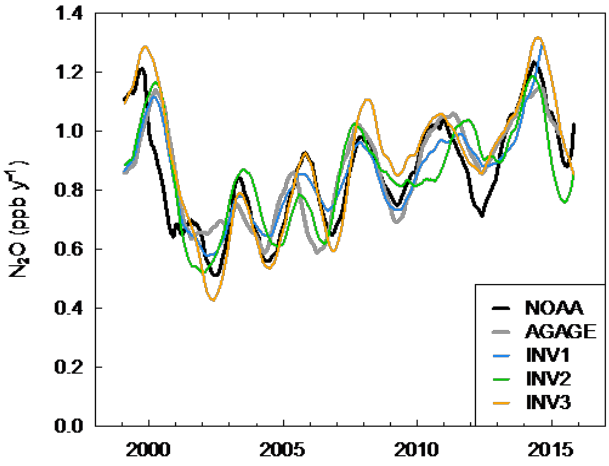


Figure: Observed and modelled global mean growth rates of N_2O (ppb/yr). Observed growth rates are shown based on the NOAA discrete sampling network and, for comparison, the AGAGE network. Modelled growth rates were calculated by sampling 4D mixing ratio fields at the times and locations of the NOAA observations from three model simulations (the ICAS TOMCAT/INVICAT model is INV1). All growth rates were calculated with annual time steps and are shown as 1-year running averages. From Thompson et al. (2019).

SUCCESSES & CONGRATULATIONS

Ben Pickering participated in a House of Lords Chamber Event
Ben Pickering participated in a debate in the House of Lords on sustainability. He was attending as a representative of the Royal Meteorology Society and managed to get a few words in. See video recording here: https://www.parliament.uk/business/lords/get-involved-with-the-lords/outreach-programmes/lords-chamber-event/2019-chamber-event/

"Since 2007, the House of Lords has opened up the chamber once a year, inviting people from across the UK to take part in a debating event in collaboration with the English Speaking Union. These are essentially a set of short debates on topical issues, organised by the House of Lords as an outreach activity similarly to "real" debates and carried out in the Chamber. This year, the invitation to participate was extended to members of the Royal Meteorological Society and the Royal Geographical Society along with students from ten schools representing a diverse range of schools across the full geographical area of the UK. This was an incredible opportunity to take part in a public discussion of the chosen topic: 'How can we reach a sustainable future?' in the magnificent and historic Lords' Chamber."
Read more: https://www.rmets.org/news/house-lords-chamber-event-how-can-we-reach-sustainable-future?dm_i=2PRB,Z7NN,6HKX10,3P871,1.

Dr Leighton Regayre has received funding from the Newton Fellowship
Dr Leighton Regayre has received funding from the Newton Fellowship for the CSSP-China project "Aerosol effects on Chinese regional climate dynamics". This project is a collaboration between statisticians, modellers and observational scientists at Leeds, Reading, Edinburgh and Bejing.

Climate Press celebrates one year
The Climate Press is an independent climate outreach project that was born during the first Youth Strike for Climate on March 15 2019, when PhD researchers at the School of Earth and Environment identified the eagerness of young people to know more about climate change. At the same time, there was a gap in the access and appeal of evidenced-based information and climate-related research for public consumption. In an effort to address this gap and bring climate science, public understanding, and action closer together, The Climate Press has spent the past year producing podcasts and publishing blogs about climate change.

From the history of climate change to the ozone hole, ice sheets to trees, sustainable cities and climate change adaptation, several ICAS academics and projects have featured in the podcast series, as well as researchers from the Priestley International Centre for Climate, the Centre for Decision Research, and the School of Chemical Processes and Engineering at the University of Leeds. The show has also received international contributions from researchers at the University of Western Australia and the EUREC^{4}A field campaign in Barbados.

The Climate Press also has an active blog section, where PhD and Postdocs from the Universities of Leeds, Oxford, Reading, and Bergen (Norway) have written great blogs about a wide range of topics, including thunderstorms, hurricanes, jet streams, coral reefs, and decarbonising academic conferences. Several artists from the Leeds College of Music have contributed music. The project aims to be collaborative and multidisciplinary; inviting artists and scientists of all disciplines to contribute. Everyone has their own unique and diverse way to communicate, understand, express, and respond to something as big as the climate emergency. The Climate Press aims to become a collaborative space where all those different perspectives meet to adapt the climate knowledge we are surrounded by at university to everyone.

The second season of the podcast series kicked off in January, sharing dreams of a low carbon future, emphasising that the climate emergency is not only a crisis, but also an opportunity to hit the reset button, and start thinking on the type of future we want to have. The Climate Press continues to learn from our early experiences, establishing the podcast, and making exciting plans for future episodes!

Of course, the Climate Press would not be possible without your help! If you would like to collaborate by writing a blog, please visit their website www.theclimatepress.com/contact for more information. You can follow them on Twitter @TheClimatePress and on Facebook and keep an eye for updates.

Image: Selfie of Paloma Trascasa-Castro (l) and Bianca van Bavel (r) at the Leeds Student Radio Recording studio getting ready for an interview.

PROJECT NEWS

UK Scientists participate in the international EUREC⁴A project

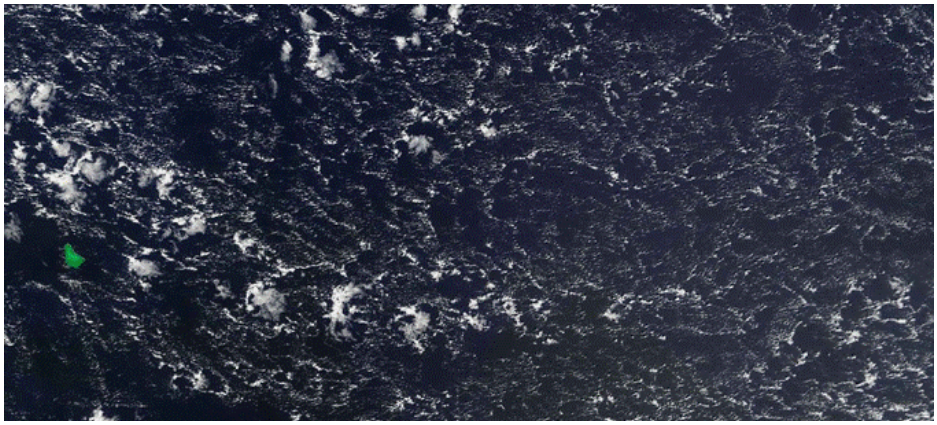
NCAS and ICAS scientists have recently returned from participating in the successful international EUREC4A project in Barbados. The project was led by Sandrine Bony (LMD, France) and Bjorn Stevens (MPI-M, Germany) and involved scientists from several countries including France, Germany, the UK, the US and Poland. The goal of EUREC4A is to better understand the behaviour of trade-wind cumulus clouds and their role in climate change. The project was based in Barbados because these clouds appear over the Atlantic Ocean to the east of the island on an almost daily basis in January and February.

The different cloud types and structures have recently been categorised as sugar, gravel (see right), flowers and fish. It is important to understand the physical properties of these clouds, their structure and the two-way interactions with the larger scales, so they can be accurately represented in global climate models. In fact, these clouds cause the most uncertainty in current climate models; the models disagree on the changes to cloud cover as the Earth warms.

The UK group, including ICAS and NCAS scientists, used the BAS Twin Otter aircraft (shown below left) to study the aerosols and cloud physical properties, including the formation of warm rain, the properties of detrainment layers, and the influence of rainfall evaporation on cloud organisation via cold pools and gust fronts, all in the context of the large-scale environment that was observed by other participants in the project. The field campaign involved five research aircraft, four research vessels, marine autonomous vehicles, the PoldiRad radar, satellite remote sensing instruments and many ground-based remote-sensing and aerosol instruments at the Barbados Cloud Observatory and Ragged Point.

The project was a great success for many reasons. (1) There was a strong sense of cooperation and collaboration between the participants. (2) The UK objectives of making observations of the life-cycle of the cumulus clouds were all addressed with the Twin Otter flights. We made 25 flights of about 3.5 to 4 hours each, most of which were coordinated with other aircraft. Sugar, gravel, flowers and fish regimes were well sampled during the project. (3) Several African dust events were observed. Interestingly, the concentration of cloud drops during these events was as high as 700/cc compared to about 150/cc on days outside the events. (4) Cold pools dominated the organisational structure of precipitating clouds (see above image) and they were well measured by the various platforms and instruments.

Images - Above: ICAS and NCAS scientists Steef Boeing, Leo Saffin, Zhiqiang Cui, Phil Rosenberg, Leif Denby and Alan Blyth with the other UK participants from the University of Manchester, the British Antarctic Survey and the Met Office. Doug Parker, Alan Gadian and Ralph Burton supported the project from Leeds.
Left: BAS Twin Otter aircraft at Barbados Grantley Adams Airport. Credit: Alan Blyth.
Below right: NASA WorldView (MODIS) image of trade-wind cumulus clouds (mainly gravel) organised by gust fronts and cold pools as they march across the Atlantic Ocean. Some of the clouds have developed outflow (detrainment) layers. Barbados is the island shown in green.



NEWS

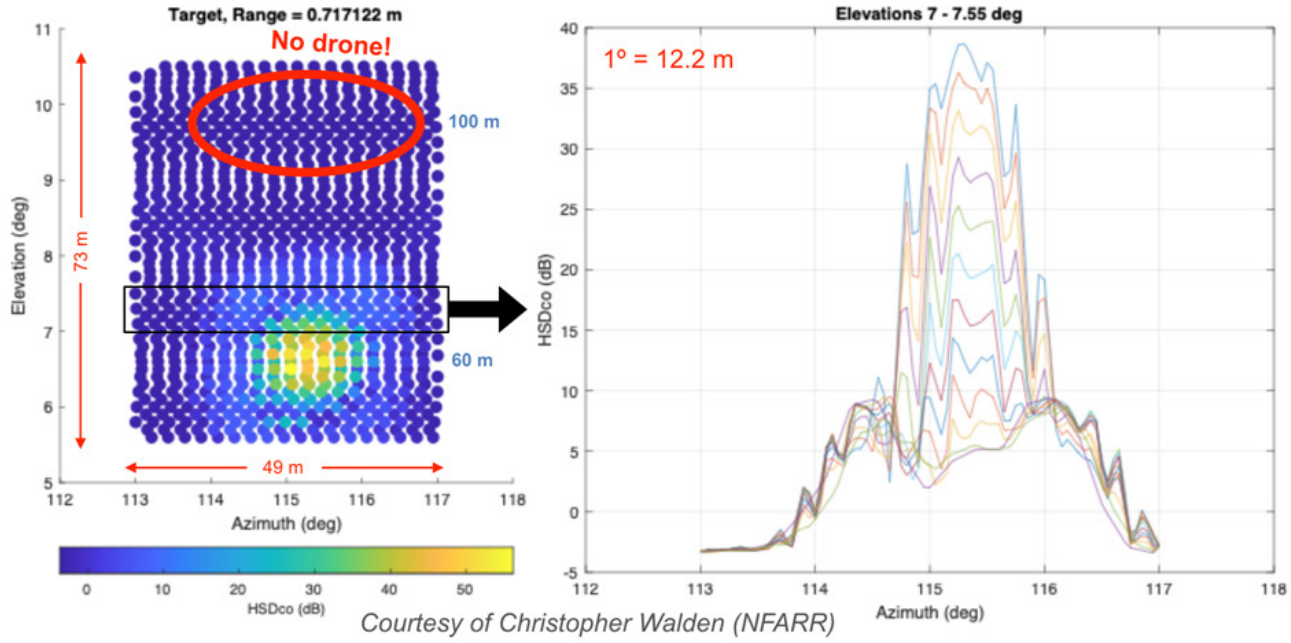
Improving Weather Radar Observations with Drones:

From 14-16th October a novel radar calibration technique was tested at Chilbolton Observatory, Hampshire.

The work, led by Ben Pickering (ICAS), Chris Walden (NFARR), Freya Addison (ICAS), Ryan Neely (NCAS/ICAS), follows similar techniques first used in France and the USA to correct the biases in radar measurements, which is notoriously difficult to achieve in line with modern demands of weather radars. The experiments consisted of tethering a steel metal ball from 40 metres below a six-rotor UAV capable of lifting 6 kg. The radar called Kepler was positioned 700 metres away and scanned around the steel ball which shows us the pattern of energy being emitted from the radar.

This ultimately improves the accuracy of future radar measurements because knowing the distribution of energy in all directions (the radar does not just emit radiation directly where the dish points) is one of the required variables in the radar retrieval equation. This work was a preliminary demonstrator and has allowed the submission of a proposal to expand this work to other radars in the UK, notably the NCAS NXPol radar, currently based in Cumbria for the RAINE project.

Ben Pickering hopes other projects in ICAS can utilise the Civil Aviation Authority permissions that he obtained, which are mandatory for research.



2D beam pattern

Horizontal cross-sections of beam pattern

Figure (above) and Image (left): Novel radar calibration technique was tested at Chilbolton Observatory, Hampshire. Credit: Ben Pickering.

OUR PARTNERSHIPS

Updates and new information from our five 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).
Leeds Met Office Academic Partnership News (from John Marsham)

•Many thanks to **Doug Parker** for his leadership of MOAP since its inception in 2011. The success of the partnership is clear.

•Welcome **Jon Petch** as an ICAS Visiting Professor. Jon is Head of Regional Model Evaluation and Development and this is a major opportunity for the Leeds MOAP.

•Congratulations to:(i) **Sean Milton** on his promotion to Associate Director Foundation Science at the Met Office, (ii) **Adrian Hines** for his promotion to Head of Climate Science IT. Adrian will now move to our new "Computational Approaches" theme (see below).

•Welcome to Mark Harrison (Head of UK Applied Science) who takes over from Adrian as Met Office lead for our Weather, Climate and Social Science theme.

•The Met Office Scientific Advisory Committee (MOSAC) and Science Review Group (SRG) together review the Met Office Foundation, Weather and Climate Science programmes. The volume and quality of Leeds work shown or referred to throughout the event was very encouraging – I think we were the most prominent University member of MOAP. This is a reflection of the leadership of the MOAP from Doug over the years; the role of LUMOS; many people's individual contributions and collaborations, as well as the School and University level support for the partnership.

•The nine themes of the new Met Office Research and Innovation Strategy are: Prediction across time-scales, Hazards to decision making, the Path to high resolution, Ensembles, Environmental Complexity, Next generation modelling systems, Fusing simulation and data sciences, Research to production, and Producing, refining and delivering data. This provides opportunities well beyond ICAS, e.g. within Priestley, Computing and beyond.

•In line with our growing computational expertise in CEMAC, and the new MO strategy, the Leeds MOAP is adding a new theme "Computational Approaches" led by Steve Arnold and Adrian Hines.

•The Leeds MOAP "Observations and Processes" theme will expand to include our growing capacity in global climate and its dynamics (e.g. work from groups of **Amanda Maycock** and **Piers Forster**). Research on Solar weather (**Dan Marsh**) will be included in the composition theme.

•We have outstanding scientists from the Met Office with Visiting Professor positions at Leeds (**Adrian Hines, Sean Milton, Jon Petch** and **Simon Vosper)** we will build the profile of such individuals at Leeds and in the Met Office to increase both collaboration and visibility of our work, so we can look forward to e.g. more seminars (possibly virtual) in the future.

•To enhance collaboration with Leeds School of Computing and build AI/Machine Learning capabilities in SEE we have Computing Machine Learning MSc projects being co-supervised from SEE for the first time.

•Discussions on SuperRAPs (cross MOAP meetings, possibly with external partners) are ongoing for machine learning and food systems (both with Leeds taking leading roles on the committees)

•There is an open call for up to two new Universities to join the MOAP partnership to address one or more of: data Science, hazard to decision making and computational science (existing partners can't bid into the process but they can still work on these topics).

•Deadline for Met Office CASE PhD proposals is 31 May 2020. This is primarily for projects to be advertised in the Autumn, but existing students may apply retrospectively via their Met Office collaborator.

•The Met Office collaboration TWiki is being retired: all users should have received an email on this and replacements.

Finally, it is important to note that whilst many collaborations within Leeds MOAP have been initiated 'top-down', many others are 'bottom-up'. Groups such as Met Office PEGs, and visits/secondments, have provided important leadership opportunities for early-career scientists in both MO and Leeds. If researchers at any level have ideas for the MOAP at Leeds, please contact myself (**John Marsham**) and/or **Paul Field**.

FEATURED PERSON:

What is your role in ICAS?
I am a NERC Independent Research Fellow and Associate Professor in Climate Dynamics. From 1 July 2020 I will become the new ICAS Director.

What do you like the most about ICAS?
It's a real treat to have the opportunity to see and hear about all the interesting research going on across the Institute. From cloud nucleation to soil science, the breadth of science is hugely stimulating. We also have a fantastic cohort of PGRs and PDRAs who are a joy to work alongside.

Why did you choose this career and how did you get here?
From a young age I wanted to be a vet as I loved animals and science. I spent many an hour reading James Herriot! I had a crisis of confidence during my university applications and decided to study physics at Manchester University instead. During my time there UMIST and Manchester Universities merged, and I was able to take courses in atmospheric physics and meteorology for the first time. I was excited to find a discipline that combined my interest in physics with my passion for the environment, so I decided to study for an MSc then PhD at Reading. The rest, I guess, is history, but I've been fortunate to have some great mentors who have encouraged and supported me along the way.

What scientific achievement are you most proud of?
I was honoured to receive a Philip Leverhulme Prize last year and had the chance to meet one of my science heroes, Lord Martin Rees.

What does a typical working day involve for you?
I do a lot less travelling now I have a young child, so I am usually in the office. I normally get in early, answer emails, meet with people in my group, teach, write (papers, proposals, reviews), plan projects and, on a good day, find time to do some coding and analysis. I also drink the occasional mug of Yorkshire tea.

What's the most interesting aspect of your job right now?
I'm excited to be working on the CONSTRAIN H2020 project with partners from across Europe to improve near-term climate projections. It's also an interesting experience being involved with IPCC WGI for the first time.

What's the most challenging aspect of your job?
Not drowning in email! And trying to carve out time to think about new research ideas.

How do you decompress outside work?
These days I am normally goofing around with my 2-year old son who is the perfect antidote to work stress. I enjoy cooking and I'm also a bookworm and like reading about history of science and epigenetics in particular.

What bit of information about you is likely to surprise your colleagues?
I was a rebellious teenager and used to have shaved pink hair.

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