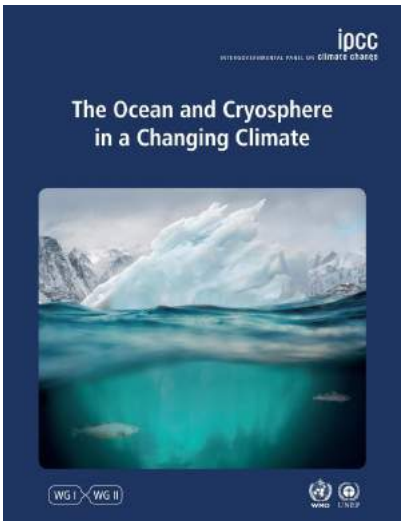
UNIVERSITY OF BIRMINGHAM | SCHOOL OF GEOGRAPHY, EARTH AND ENVIRONMENTAL SCIENCES

GEES **BULLETIN**

Issue 427 **27 September 2019**

News

IPCC Special Report



On Wednesday the IPCC launched a *Special Report on the Ocean and Cryosphere in a Changing Climate (SROCC)*, which assesses the impacts of climate change on the oceans and the cryosphere and it's effect on marine, coastal, polar and mountain ecosystems. **Sandy Milner** was a lead author on the mountain chapter, which examined the impact of a shrinking cryosphere in mountain areas on water resources, hazards, ecosystems, tourism and human livelihoods in these regions and down valley during this century. Options for adaptations to limit the consequences are also considered. The SROCC report has six chapters with 104 authors (6 from the UK) from 36 countries and cites close to 7000 references. The report generated a great deal of media interest as the lead story on most major news outlets on Wednesday. The download site for the report chapters and the summary for policy makers is ipcc.ch/srocc/download-report/

David Jaroszweski spoke to the Midlands Today Science Correspondent David Gregory-Kumar about the School's work on climate resilience on Friday the 20th, in a piece related to the UN Climate Summit and the local protests. It centred on the potential impacts of climate change in the Midlands and how infrastructure companies and researchers are working to understand and address these. The piece highlighted recent and ongoing work on heat-related rail disruption. Footage of BIFOR was also featured in the introduction, as a contrast to demonstrate the range of the University's climate-related research.

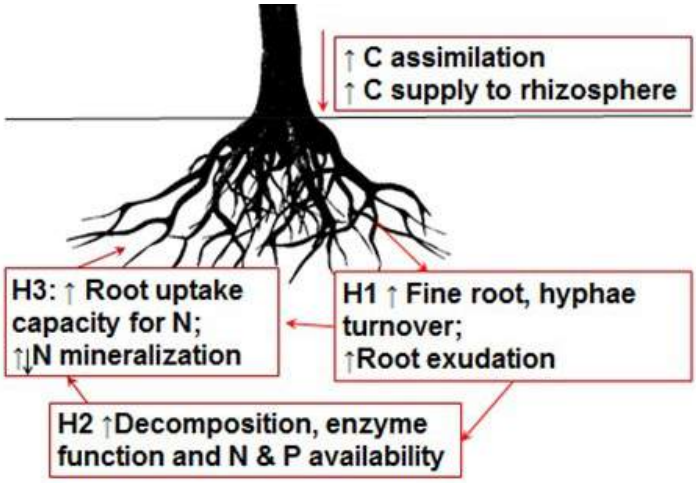
NERC Discovery Grant Success

Our project proposal-**FACE Underground**: can trees in mature forests gain greater access to soil nutrients under elevated atmospheric CO_2, is funded recently by NERC (£795,600). The project team includes **Sami Ullah (PI) and Liz Hamilton** at UoB, I. Hartley at Exeter University and E. Sayyer at Lancaster University together with H. Rennenberg as a project partner at Freiburg University, Germany. The proposal was awarded a science excellence score of 10/10 by the NERC panel while commenting that *"the proposed research merits the highest possible priority for funding"*, which is indeed very humbling for the project team!

This project will directly addresses a global challenge and uncertainty – how future elevated atmospheric CO_2 (eCO_2) concentrations will influence forest

productivity and carbon sequestration, and how soil nutrient availability, particularly nitrogen (N) and phosphorus (P) will constrain such a CO_2 fertilization effect. This uncertainty about the role of nutrient availability in regulating carbon (C) sequestration by temperate deciduous forests under future climates is particularly critical for Earth System Models.

The overall aim of the project is to investigate the extent to which mature forests can alleviate nutrient limitation through increased below-ground C allocation under eCO_2. Experimental work will be undertaken at the BIFoR-FACE facility to address three main hypotheses that a) fine root and mycorrhizal hyphal turnover, and root exudation rates will increase under eCO_2, b) rates of decomposition, microbial enzyme activity and nutrient availability will increase under eCO_2, and c) root N uptake capacities will increase under eCO_2, particularly for organic nitrogen forms to alleviate N availability competition with soil microbes (Fig 1). The experimental work will include the application of a range of techniques including isotope tracing for N transformations, root boxes for *in situ* root and mycorrhizal turnover, metabolomics for exudates fingerprinting, passive high resolution nutrient sensing (DET &DGT) and application of an automated root exudation system coupled to microbial community functions, decomposition and roots N uptake preferences.



Hypothesised changes in C transfer and nutrient cycling mechanisms

Ultimately, this project will generate the first detailed assessment of whether, and how, mature trees can increase nutrient uptake under eCO_2, thus generating the mechanistic understanding required to inform coupled nitrogen, carbon and phosphorus and Earth System Models for predicting mature forests responses to future climate change. At BIFoR, we are really excited to be addressing research questions of global significance by capitalizing on the investment (>£20 million) of the University of Birmingham in setting up this unique FACE facility in Staffordshire, UK.

Rescaling the Border: Nationalism and Civilisationalism in Central and Eastern Europe

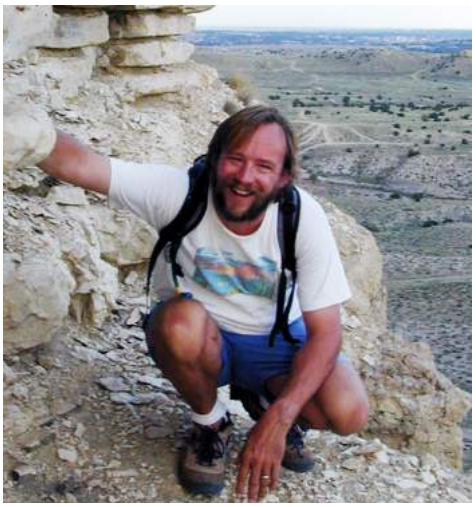
Paul Richardson has been awarded funding by the British Academy for a project on "Rescaling the Border: Nationalism and Civilisationalism in Central and Eastern Europe." This comparative study will explore how identities are being remade in borderland communities subject to increasing tensions associated with populism, nationalism, migration and religious identities. It will fund fieldwork in three key case-studies in Kharkiv (Ukraine), Adjara (Georgia), and the Székelyföld (Romania).

Paul was also invited earlier in the summer to the 6th Annual Conference on Eurasian Politics and Society held at the Universidade Autónoma de Lisboa on 4-5 July in Lisbon, Portugal. He gave a presentation at the conference's book discussion session on his monograph "At the Edge of the Nation: The Southern Kurils and the Search for Russia's National Identity" (University of Hawai'i Press, 2018).

Fulbright Foreign Scholar Prof Bradley Sageman to visit GEES Earth Sciences

Between the 1st September and 1st December Prof Brad Sageman will be a visiting scholar in Earth Sciences. Prof Sageman's visit is supported by a **J William Fulbright Foreign Scholarship**. The Fulbright Programme is the flagship international educational exchange program sponsored by the U.S. government. Fulbright alumni include 59 Nobel Laureates, 84 Pulitzer Prize winners, 72 MacArthur Fellows, 16 Presidential Medal of Freedom recipients, and thousands of leaders across the private, public and non-profit sectors. Prof Sageman's project is entitled: ***"Extending Late Cretaceous Carbon Cycle Studies to the Southern Hemisphere"*** and is collaboration between **Prof. Sageman, Sarah Greene and James Bendle** who will undertake the first comparison of contemporaneous marine and terrestrial deposits from the southern hemisphere for an Ocean Anoxic Event (OAE2) or probably any ancient warm climate event. The scope of the project and the deliverables are critical for understanding the poorly-constrained carbon-cycle for the Cenomanian – Turonian climate system. Prof Sageman has written the following personal message:

I am a professor in the Department of Earth & Planetary Sciences at Northwestern University, where I have conducted research and taught courses in the fields of stratigraphy and geochemistry for the past 27 years. I am most proud of the diversity of my research contributions, spanning many subdisciplines, my 12 years of service as department chair, which achieved a renaissance in our unit, and my devotion to excellence in teaching. During my graduate studies I was awarded my first Fulbright for a year of research at Universität Tubingen (Germany), and the experience was transformative. This time around the motivation to apply was a bit more personal: at the memorial for a very close friend who succumbed to cancer several years ago, I met a faculty member from the University of Birmingham. He had recently come to know and admire my late friend, a professor of geology at Yale, through their shared interest in paleoclimate studies. Because paleoclimate reconstruction is also a focus of my research (motivated by concern for the future of Earth's climate system), the possibility for new collaborative work was born out of deep loss. My new colleague encouraged me to apply for a Birmingham-Fulbright award, and the rest is history! The work we will complete together will be dedicated to the memory of Professor Mark Pagani.



Prof Brad Sageman at Lake Pueblo State Park, the home of the Global Stratotype Section and Point for the Cenomanian-Turonian boundary.

GEES Writing Retreat

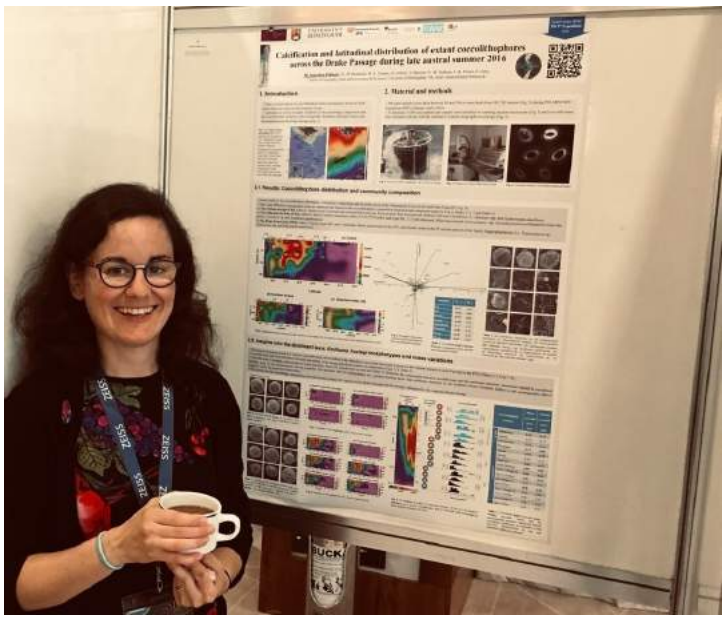
The 2019 GEES writing retreat in the Peak District took place from 4 to 9 August and had 12 participants from Physical and Human Geography and Environmental Science. The week was again very productive and collaborative. This time we trialled structured writing in the morning (Pomodoro-style writing blocks of 40 min, interspersed with breaks for sharing objectives and results), which we really enjoyed. Overall, the writing retreat was successful and we are looking forward to the 2020 edition and to the publication of our writing.

17th International Nannoplankton Association Meeting

On the 16th September, **Mariem Saavedra-Pellitero** gave one of the four keynote lectures at the 17th International Nannoplankton Association (INA) Meeting held in Santos (Brazil) entitled "Living on the edge: Polar coccolithophores" (http://ina.tmsoc.org/meetings/INA17Santos/INA17Abstracts.html). The INA organizes international conferences every two years, and this year it was hosted by Felipe Toledo and Karen Costa from the University of São Paulo.

Mariem Saavedra.Pellitero (center) receiving some presents from the organizers after the keynote lecture at the 17th INA Meeting. Picture by Felipe Toledo

In her talk, Mariem tackled the increasing interest in coccolithophore and calcareous nannofossil ecology at high latitudes and showed her own polar research carried out during the last 8 years, mostly at the University of Bremen (Germany). She also presented the latest findings from International Ocean Discovery Program (IODP) Expedition 383, from 20th May to 20th July 2019, in which she sailed as a Micropaleontologist. This IODP expedition investigated Pliocene– Pleistocene atmosphere-ocean-cryosphere dynamics of the Pacific Antarctic Circumpolar Current, and their roles in regional and global climate and atmospheric CO_2. Additionally, Mariem showed two posters from her most recent publications in Biogeosciences and Quaternary Science Reviews.



Mariem Saavedra.Pellitero during the poster session at the 17th INA Meeting.

RTPI Planning with Communities Conference

Troy Hayes introducing the Conference in Reading Town Hall

On Wednesday 18th September, **Charles Goode** attended a RTPI Conference in Reading on effective ways that the planning system can engage with communities. It included very interesting talks by Professor Zef Hemel (University of Amsterdam) on open planning in Amsterdam, Troy Hayes and Maggie Baddeley (both of Troy Hayes + Design) on a major research project on planners and community involvement, Brian Whiteley (Planning Aid England) on the work of Planning Aid and how planners can volunteer to help deprived communities, Annabel Le Lohe (WYG) on public engagement in Toronto and

Angela Koch (Imagine Places) on her extensive experience of co-designing communities. Charles wrote a summary of the Conference for the RTPI's magazine and is writing another summary piece of his research for the RTPI's membership.

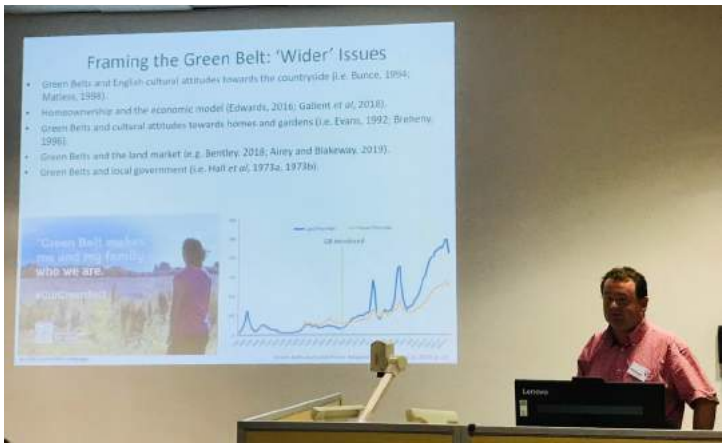
Prestigious Award Short-Listing for the Urban Observatory

Birmingham Urban Observatory is part of the consortium that has been shortlisted by THE for the STEM Research Project of the Year Award. The £12m Urban Observatory Program is the UK's largest urban experiment led by Newcastle University but also spanning Bristol, Manchester, Sheffield Cranfield and Birmingham (headed up by **Lee Chapman**, **Jon Sadler** and Chris Rogers). It is providing us with a unique understanding of how our cities work and the impact that climate change, decarbonisation, electric transport and other adaptations might have on them. Bringing together six universities in collaboration with their local authorities, the UO is the largest, open data monitoring system in the world, collecting data about 64 different urban indicators such as energy use, climate, air quality, traffic flow, pedestrian movement and even the health of urban beehives! The award ceremony is on the 28th November 2019 where we will learn our fate (as well as who will be the next University of the Year)!

Our fantastic new artwork for the Birmingham Urban Observatory showcasing the talents of our very own Chantal Jackson!

Biennial of European Towns and Town Planners

The European Council of Spatial Planners (ECSP) held their Biennial Conference in Plymouth on 11-13th September. The Conference, attended by **Ivor Samuels**, **Alex Oxley** and **Charles Goode**, was jointly organised by the RTPI, Plymouth City Council and the University of Plymouth with the overarching theme of 'Planning on the Edge'. The 'edge' includes coastal and marine planning, planning the rural-urban fringe and planning at boarders and boundaries. Plymouth was an ideal location for such a Conference with its longstanding naval and maritime connections, strategic location on the River Tamar (the boundary with Cornwall) and post-war reconstruction guided by Sir Patrick Abercrombie's *Plymouth Plan*. Indeed, in keeping with the Conference's theme, alongside lots of talks and discussion, there was a boat trip around Plymouth Harbour and a drinks reception in the Royal William Yard (a formal victualing yard)!



Charles Goode presenting on the Green Belt

The Biennial attracted planners from all over Europe/ the world and there was a very constructive atmosphere of mutual learning and knowledge exchange. The Conference was also well supported by both the present and past RTPI Presidents. Keynote speeches included Councillor Tudor Evans (Leader of Plymouth City Council), Professor Ronald Waterman (an international authority on building with nature), Bernie Foulkes (Director of LDA Design), Vincent Goodstadt (an international expert on spatial planning) and Lord Matthew Taylor (formerly a Cornish MP and a very influential figure behind

Neighbourhood Planning and the National Planning Policy Framework). There were a number of tracks and **Charles Goode** presented at a lively session on 'Planning the Rural-Urban Fringe' on the governance and management of the Green Belt planning policy. The session also included presentations on the Green Belt by Charlotte Morphet and Ollie Norman, planners from the Waltham Forest, whilst Dr Ute Knippenberger presented on the effects of urban containment in Wiesbaden, Germany so the session was ideal for extensive debate on the Green Belt and international comparisons!

Linking GEES research to the A-Level curriculum

Recently **Sophie Hadfield-Hill** started a new initiative on twitter #teachertuesday, linking open access papers written by academics in GEES to the A-Level Geography and Geology curriculum. This is already proving to be popular, with teachers are saying they are sharing our material in their classrooms (see the example tweet).

If you have an open access paper which you feel would be a good fit to the A-Level curriculum, please do email me. Example topics include:

1. Water and carbon cycles
2. Hot desert systems and landscapes
3. Coastal systems and landscapes
4. Glacial systems and landscapes
5. Hazards
6. Ecosystems under stress
7. Global systems and global governance
8. Changing places
9. Contemporary urban environments
10. Population and the environment
11. Resource security

In your email please send a) a link to the paper and b) any twitter handles which you would like the paper to be associated with.

This is a great way to showcase what we are doing in GEES, not only to teachers and pupils but the broader community.

Please send any material to Sophie (s.a.hadfield-hill@bham.ac.uk)

Publications

Saavedra-Pellitero, M., Baumann, K.-H., Fuertes, M. Á., Schulz, H., Marcon, Y., Vollmar, N. M., Flores, J.-A., and Lamy, F., 2019. Calcification and distribution of extant coccolithophores across the Drake Passage during late austral summer 2016, **Biogeosciences** , doi: 10.5194/bg-2019-186.

Remote sensing and identification of volcanic plumes usingfixed-wing UAVs over Volcán de Fuego, Guatemala. Ben Schellenberg, Tom Richardson, Matt Watson, Colin Greatwood, Robert Clarke, **Rick Thomas**, Kieran Wood, Jim Freer, Helen Thomas, Emma Liu, Francis Salama, Gustavo Chigna, *J. Field Robotics.* 2019;1–20 https://onlinelibrary.wiley.com/doi/full/10.1002/rob.21896

Coming up next week

Tuesday

10:45-11:30am
Coffee morning, Earth Sciences coffee room, ground floor A-block Aston Webb. Cups and tea/coffee will be provided.

Friday

10:45-11:30am
Coffee morning—details as above

Other forthcoming events

Joint School of GEES / IGI Seminar

Wednesday 23rd October 2019. 13:00—Room tbc
Professor Angela Gurnell
Queen Mary University of London

20 years of sporadic research on the Tagliamento River, NE Italy - what have I learned about trees, wood and fluvial processes?

20 years of research on the Tagliamento started while I was working at the University of Birmingham (until 2002). Since then I have returned to the river reasonably frequently and through field observations, experiments and excavations coupled with detailed analysis of areal imagery, I have been able to unpick how trees, wood and fluvial processes interact in very complex ways on this dynamic island-braided river. The seminar will give an overview of the outcomes from this work, which is relevant to understanding the dynamics of all humid-temperate rivers that possess reasonably intact riparian margins.

Next Issue

The next Bulletin will be published on Friday 4 October.

Contributions for the Bulletin should be sent to Lesley Ann Ford (L.A.Boyle@bham.ac.uk).

All contributions should be sent to Lesley by Wednesday 2 October.

Visit the GEES staff Intranet for forthcoming seminars, contacts, general School information and documents.

GEES on social media