



GEOGRAPHY MATTERS

Post 16 and HE Phase Committee
Spring 2021

Much has changed since 2020, but you can rely on *Geography Matters* to continue to offer its eclectic mix of experiences, advice, subject updates and geographical viewpoints.

This 2021 edition celebrates the geographical journey of 4 intrepid geographers, two of whom, Nasir and Art, we have followed each year since 2019, through their geography studies at university. Thank you both especially for ‘keeping the faith’, and we wish you well in the future. Look out for Nasir as he starts his PGCE training! We can read about a silver lining to the pandemic as Ellie Hopkins shares the benefits of local topics for the NEA, and your editor uses her long experience of moderating coursework to give top tips to review and put the finishing touches before submission. Helen Hore lifts the lid on Compassionate Geography and Iain Palôt begins to unpack understandings of decolonialism and the geography curriculum. COP26 is fast approaching and Iain’s background article nicely sets the scene. Rich Waller advances our geographical understanding of the complex impacts of climate change on Arctic periglacial degradation in a helpful, detailed yet accessible and succinct article, with the important recognition of the knowledge and insights of indigenous communities. A must-read for students studying a glaciation unit.

What’s not to like about this year’s *Geography Matters*? Very many thanks to all our contributors.

Note: the views expressed in these articles are those of the contributors and do not necessarily coincide with those of the GA.

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From the Chair

Well, what a year! I can honestly say this was the first year since giving up teaching full time that I was glad not to be in the classroom. You all have my greatest admiration for the way you have coped. Setting aside the chaos of the summer examination results and the grief that episode engendered, teaching your own children while working at home, in school, remotely, with key worker's children and without the real life contact with your classes. A year truly to forget and yet one that will remain long in the memory: *What did you do in the COVID-19 year?*

Having said that, it has been a great year for CPD. I have been amazed at the sheer volume and quality of resources that have been produced and shared around our community via Zoom, Teachmeets, on Twitter and every other method of communication possible. The ideas and techniques that have been explored give great hope for the future of Geography teaching not just in England but throughout the UK and even further afield.

Events that have had widespread repercussions for the geography curriculum include the emergence of the BLM movement following the tragic death of George Floyd in the USA. A WhatsApp group includes teachers from a range of disciplines to examine how their subject contributes to this issue. For our part, the Post16/HE PC decided that we should look at two things. Firstly, the opportunities that existed in the A level specifications for addressing these and other multi-cultural issues in a seamless manner. Hopefully this analysis will appear on the website by conference. We have already shared our thoughts with one of the examining bodies and look forward to working with them in the future.

The Post 16/HE committee also took part in some training through Global Learning London, looking at language and how we might "translate" this into our teaching in the classroom. We were introduced to a whole new vocabulary as well as Critical Discourse Analysis. The main thrust of the session was for us to question where we were in respect to the issues and what we personally needed to admit to and thus to be more conscious of ourselves. Following our second session we will try and develop some resources that colleagues will hopefully find useful in the classroom. Watch the Post 16/HE webpage.

Conf21 is going to be a virtual affair this year following the success of last year and I hope that you can enjoy what looks like an extremely interesting programme put together by Susan, Harriet and Becky. Who knows we may get to meet in person at Conf22, but in the meantime I hope the rest of this year treats you well. You can contact me at lesgrionettes@yahoo.co.uk if you would like to keep in touch with what Post 16/HE Phase Committee is up to throughout the year.

We now have a slimmed-down committee which meets (eventually) in person, but we do wish to extend our network. We have also learned how easy it is to welcome many more people to join us for meetings via Zoom, so please get in touch if you would like to share in our work remotely. The more expertise we have the better, and we love the lively debate on all post 16/HE matters which come our way.

My especial thanks go to members of the Post16/HE PC for their help and support throughout the year, to Gill for yet again pulling Geography Matters together, and to Helen our Secretary who after many years has decided that she can no longer continue to nag me and that I must take some responsibility myself. Helen is stepping down and words cannot convey the huge debt that I owe her for keeping me and the committee organised. Her minutes are second to none and she knows all the best places to eat in Guildford! Helen, you will be greatly missed but can you still book our conference meal when we are in Guildford?

Students reflect on their geography during lockdown

Nasir

(BA Geography, University College London, Third Year)

This year at UCL has undeniably been different from all of the other years in my education. Adapting to virtual learning and restrictions on fieldwork are just a few of the challenges I've had to respond to, but this year has taught me a lot of independence, patience and resilience. One thing that has kept me motivated has been my dissertation about commuter cycling experiences in London. Cycling has been my great interest, so writing about it has been an enjoyable experience. However, the highlight thus so far has been my module on Geography Education at the IOE. Education has also been a passion of mine, and therefore I always knew that I would study education when I got the chance. The module has been engaging and so insightful. Undeniably, it will also be an excellent background for my Geography PGCE at IOE next year, which I'm super excited to begin in September.



Art

(BA Geography, Queen Mary University London, Third Year)



My third year studying geography at Queen Mary has definitely not been as I expected. Online learning for the whole year has been an interesting experience. Getting used to long pre-recorded lectures on top of required readings has been challenging. Nevertheless, I still thoroughly enjoy studying Geography, in particular a module I did on the Geographies of Forced Migration which was of great interest to me due to its current global relevance. I have been kept busy with my dissertation which looks at a shopping mall in Pristina, Kosovo, and its impact on citizen perceptions of urban development in the city. Kosovo is my home country, so it was fascinating for me to explore the impacts of globalisation on Pristina. I have been lucky enough to find a job with a Marketing and Sales company so my plans for next year are to hopefully reach my goals there.

Hannah

(Geography BSc, Manchester University, First Year)

I'm currently in my first undergrad year of doing Geography with International Study BA at the University of Manchester. So far I've been really enjoying it! I like the flexibility of the course as one third of our modules this year are free-choice, meaning we get the chance to branch out into other courses and cater the degree to our geographical interests. I lean towards human geography so have been doing some social anthropology modules alongside geography. In terms of online learning it's actually been okay. Everything is recorded which makes it easier to



recap lecture material and the chat function on Blackboard and Zoom also means it's much easier to ask professors questions mid- or post-lecture. I'm still able to get out of my uni halls and go into the library, which is nice for some change of scenery.

Zerda (A level Geography student hoping to study geography for an undergraduate degree)



Looking into the current issues surrounding the COVID-19 pandemic I realized that by ruining our environment we have reduced nature's ability to shield us from disease. This and climate change have really motivated me to enlighten my geographical knowledge. A-level geography has enabled me to gain a deeper insight into the importance of sustainable resource use as a way of limiting threats towards our planet in the future. At university I would love to develop my ArcGIS skills further and explore the spatial patterns of social inequality. I hope that a geography degree will enable me to notice the human actions that contribute to resource scarcity, and prepare me to contribute to reducing the tensions it may pose on global relations, as well as develop policies to better our environment.

Who are the Post 16 / HE Phase Committee?

Iain Palôt	<i>Chair</i>
Helen Hore	<i>Secretary</i>
Naomi Andersson	Ludlow Sixth Form College
Hafsa Garcia	<i>Portsmouth College</i>
Eleanor Hopkins	<i>Prendergast School</i>
Gill Miller	<i>Geography Matters Editor, University of Chester</i>
Laura-Jayne Ward	<i>Whitley Academy</i>
Richard Waller	University of Keele

Many of our meetings are online these days. If you are interested in joining us via zoom, then you are always welcome. Contact Iain at lesgrionettes@yahoo.co.uk

Teaching the NEA during the pandemic – reflections

Ellie Hopkins
Prendergast School

This year, sixth form teachers have undoubtedly had to rethink their NEA provision because our A Level curriculum integrates fieldwork throughout year 12. Early in the course, in September, students visit the coast whilst studying Coastal Systems and Landscapes. In March, students visit Stratford, London, whilst studying Changing Places. This coordination allows for conversations about the NEA to occur at the very start of A level giving students time to develop their interest in a research project. As Figure 1 shows the original plan did not happen! However, new experiences come from change and this article describes the challenges and learning experiences from teaching the NEA during the pandemic.

2021 Cohort: Original plan	2021 Cohort: Reality as a result of Covid-19
September 2019 – Coastal fieldwork day March 2020 – Stratford fieldwork day June 2020 – Two days for fieldwork collection – Stratford or coastal location. Summer term & holidays – Independent write-up	September 2019 – Coastal fieldwork day December 2020 – Local collection of fieldwork January 2021 – 5-week write-up

Figure 1: A table outlining NEA changes

Changing fieldwork locations

The first major change was rethinking our fieldwork locations. For the last 5 years my students have visited Stratford, an excellent place to see urban change and the impact of regeneration. On occasion we have arranged to go up the viewing platform and down the orbit slide (which if anyone can include in their field trip day, it is a highlight for many students!). However, I have always been an advocate for local fieldwork. Previously all students in a group had to collect their NEA in the same location (such as Stratford) but the projects lack individuality, tended to be repetitive and the weakest students became stuck in the trap of simply evaluating the success of regeneration (similar to GCSE fieldwork). However, in another teaching post, my students were actively encouraged to collect fieldwork data locally. Projects shone with individuality and overall students were much more engaged throughout the whole NEA process as they investigated a local topic that meant something to them.

As a result, I was actually excited when we changed to local fieldwork. Students collected data independently and travelled by foot. This led to a variety of titles as Figure 2 shows. There were additional benefits including increased background and spatial awareness that supported site planning and selection; students found sourcing interviewees easier; and they were able to revisit locations if needed.

Changes to data collection

The second major change was the ability (or inability) to collect primary data. Students had imaginative proposals for research and were ready to collect data just when London went into Tier 3. By the time of the national lockdown about half of the student cohort had managed a day of data collection whilst others had nothing.

Local fieldwork – titles submitted
To what extent is there evidence of inequality in Southwark?
A comparison between Peckham Rye and East Dulwich
How has gentrification from 2000 to 2020 shaped people’s place attachment to Brockley?
How does urban design impact sense of place in Brixton, Coldharbour?
How has the development of Lewisham’s transport system affected quality of life overtime?
To what extent has crime and crime-based media affected the public's perception of Brockley?
To what extent does the availability of green-spaces influence quality of life in Lewisham?

Figure 2: A selection of titles of local fieldwork

Questionnaires

Students moved from using Survey123 to collect questionnaire data (as these require students to input the data themselves), to using Google forms/Survey Monkey. Students gave the public slips with a QR code (Figure 3) or shared the survey link on local community websites. Usually, students can take half a day to gather questionnaire results for only 30 people. By using online surveys, they were able to collect more data in a shorter period of time, increase the sample size and reach a range of different participants. Additionally, analysis of data improved as students had more data to use for statistical testing.

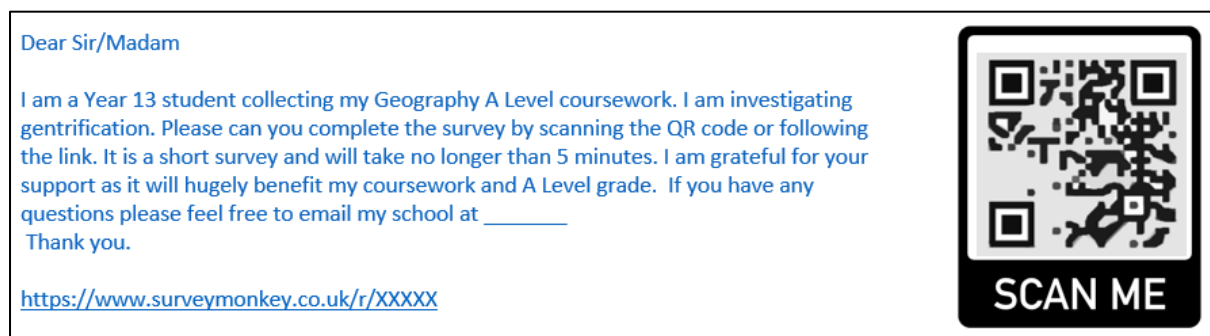


Figure 3 Questionnaire slips

Interviews

Students were encouraged to have in depth interviews with local family members in person, or over the phone with residents in the local area. As most students collected fieldwork data in an area local to them, they knew members of the public to interview. This contributed to their primary qualitative data collection which enabled some in-depth analysis using coding.

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A stronger emphasis was put on including secondary data and all students presented results using ArcGIS. Fortunately, they already had research skills embedded from the Changing Places unit. In lessons they used secondary research (including census data, photo analysis, crime mapping, land use mapping with GIS and Layers of London) to investigate changes to their local and distant place. I only had to make a few short videos for students to troubleshoot GIS issues and directed students to ESRI's school resources for step-by-step guides. The GIS maps and data presentations produced by students were really impressive.

Changes to write-up time frame

Later fieldwork collection meant that time for write-up was limited. We decided that students would write up their NEA in the controlled assessment style where every lesson/week would be dedicated to writing a particular section. However, as schools transitioned to online learning from January, this meant students were at home for their whole NEA write up. Something we had not planned for!

Usually, we give students a booklet with the mark scheme and checklists for success. We teach using the interactive white board to go through the booklet and review exemplars. A large wordy document with small text is useless on a Microsoft Teams lesson! The quantity of text is overwhelming and students were unable to access it. So began the task (probably the most time consuming) of creating in depth PowerPoints. These still followed the booklet but broke it down into smaller chunks with some sections of the exemplars annotated. This meant that if students missed an online lesson, they had resources available. All PowerPoints were made available to students for reference on Google Classroom. We found this short and intense write-up time frame very effective. Compared to previous years, students were much more successful at meeting the short deadlines. Work submitted was a higher quality and showed the application of instructions from PowerPoints. Also, students seemed not to have lost as much enthusiasm. The department now has a bank of NEA PowerPoints to accompany the booklet and so future cohorts will no doubt benefit.

Moving forward

It is safe to say that there have been changes to schools' fieldwork provision. I found some useful takeaways from the changes and I hope others have too. In summary, my top three learning points are as follows:

- Local fieldwork provides more opportunities for independence
- Online surveys increase sample size and questionnaire success
- A short write-up time keeps students on track and enthusiastic to the end.

Your NEA: the Last Lap

Gill Miller

Time to celebrate? You've done it! You've written the last words for your investigation. Who would have imagined it possible this time last year? Now you can relax....

Or not.



You cannot afford to relax your efforts just yet. Despite all your angst, energies and hours of work, there is still time to lose many of those precious marks you need.

How? Because this is the moment when you need the most self-discipline. This is the moment when you must review your NEA with a beady eye.



Here is some practical advice: 10 areas with questions you need to ask to avoid losing marks, and even gain some more. Go through the list and check that you've covered everything to make your research as professional as possible.

1. Does your **title** accurately reflect what you ended up doing? If not, change the title.
2. Is your **aim** stated clearly and explicitly
Have you addressed all your objectives or hypotheses? If not, delete those you haven't investigated. Did you end up doing something slightly different to a stated objective? If so, make that clear. And explain the changes in your evaluation.
Have you explicitly stated the link(s) to the specification?
3. Have you briefly referred to **theory** or geographical concepts in your Introduction, and linked it to your objectives?
4. Is your **method** written in sufficient detail that another person could replicate it exactly?
Have you explained and justified your sampling method and, really important, your sample size?
5. Is the **presentation of your findings** integrated into your text?
Have you used a variety of types of presentation? Have you avoided 'death by bar charts'? Have you used the most *appropriate* styles of graphs / diagrams? For instance, are you sure that your pie charts are an appropriate style to use?
Does every graph have labelled axes?
Have you presented graphs, maps etc so they can be easily compared or linked to one another?
If you are comparing graphs, do they have the same vertical scale? You must *never* have one graph per page. Big does not mean better.
Does every map have a key and a north sign? If you don't have a map, then include one. This is geography after all! *But please, not a map of the UK with a dot on it showing your location.*
Are the Google maps clear? Do you need to brighten them?
Do the maps and photographs have a purpose? Do they show what you want them to show?
Have you annotated every resource to say what it shows? Doing so will save descriptive words.

Does every resource have a title and number for reference in your text?

Have you numbered your pages?

6. Have you **organised your research** effectively?

Have you taken each objective or hypothesis, one at a time, and presented findings and analysis together? Are they considered in a logical order?

Have you referred to *every* relevant resource in your writing? Are there any resources which you have not referred to? Why not? If they are superfluous, delete them.

Do you have Appendices? If so, have you referred to these? If not, what purpose do they serve?

Have you referred to literature in your writing?

7. In your **conclusion**, have you summarized your findings? You must not re-write what you said in the analysis section.

Have you referred back to each objective or hypothesis?

Have you related your findings to the theory you outlined in your Introduction? Do the results support or refute the theory? In what way? And why?

8. **Evaluation**. Is this more than 'bad weather/not enough data/not enough time'?

What would you do better to improve your work next time?

Have you thought about what you could do to follow up your results? Where might this research go next?

Are your results partial? (They only reflect one aspect of your topic). Tentative? (Your sample is small so these findings may be just an indication). Incomplete? (The results only give a snapshot of data collected at one moment in time).

9. **References**: An essential part of good research. But please, do not list generic search engines like www.google.com. These are meaningless. You must be specific. And list in alphabetical order, by author, or organization.

10. Have you noted your **word count**? If you're over the recommended limit, can you edit to lose words? And if you're well over the recommended word count, look at how much description you've written and put that into annotation around your resources. You're only going to get marks for analysis and interpretation.

Now you're done! And you should be thoroughly proud of yourself for being disciplined enough to check all these little corners which will make your NEA the very best it can be.



WELL DONE!

And good luck!

What is Compassionate Geography?

Helen Hore

You may be thinking about where 'compassion' fits into geography. Compassion is central to understanding the inequalities that geographers spend a lot of time considering. Fully understanding the wide range of global issues in the 21st century requires empathy and an emotional response. For instance, for teachers, this means not just teaching that inequality exists but why it exists, the impact it has on people, why it is perpetuated, where power lies in society, and how to remove the barriers to accessing basic needs for all people. How invaluable is fieldwork and video in this regard? We see that compassion is required in the aftermath of disasters, in aid-giving and in providing basic needs in refugee camps. We hear less about the longer-term mitigation of the impacts of such events, as this is less newsworthy. But this is also where true compassion is needed.

Why do we lack compassion?

In a market economy, value is determined by market price or how much people are willing to pay for a commodity. It is therefore surprising that we do not put a higher value on things such as clean air, water, and good food that we, as human beings, most need to live safe, healthy, fulfilling lives. Instead, companies are permitted to pollute the environment and to pay low wages, to maintain profits, sending both social justice and environmental sustainability out of the window.

It is staggering to many people in the UK and other wealthy western countries, that some members of our communities cannot feed their families without resorting to food banks due to the rising cost of rent, council tax and utilities, whilst wages and benefits remain relatively low. As a society, we may be compassionate in giving to food banks but are we actually helping to solve the problems causing food poverty? Truly compassionate societies ensure that a viable and dignified safety net, through a benefit system, is available to all when they are temporarily unable to cope. Food banks, such as those run by the Trussell Trust, work with local services to identify people in need and to support them with more than just food.



<https://www.trusselltrust.org/>

A revolution is required in housebuilding in the UK, not only to provide enough affordable housing but to build sustainably for the future. This is a lot to ask, but let us have some short-term strategies to house people and long-term strategies for good urban design. Sustainable urban living is not just about providing a roof over people's heads but an environment where people can grow and contribute. Lockdown has emphasized the need for open spaces in which to relax and connect with nature, and recent rising temperatures have shown the necessity for homes which are both suited to a warming climate while also reduce CO₂ emissions. Heat deaths have increased in cities over recent summers as developers, through inadequate design, have failed to consider the increased need for ventilation in high-rise flats. (Ward in the Guardian 2018)



Despite the Sustainable Development Goals, the environment is still given little value in market economies, to the extent that protecting it is viewed as an unnecessary cost. GDP (per capita) is still used as the main measurement of a country's success rather than how healthy are its human or biological resources. Mark Carney, Governor of the Bank of England, argued in the Reith Lectures 2020, that our sense of value needs to change. Geographers have long used the concept of ecosystem servicing to illustrate how intimately we depend on our planetary resources to live and how easily they are destroyed without protection. The 'tragedy of the commons' has been played out in many local ecosystems with resources exploited for gain short-term profit such as in the continuing destruction of the Amazon rainforest. There is now a call from economists to put



a value on this 'Natural Capital' and use it as a measure of natural and human resources. This reflects emerging compassion for the value of ecosystems services and it is hoped that this will be adopted by the UN in 2021 as a global standard. (Bennett Institute 2020)

Poor record on environmental damage and human rights

The fashion industry has a notoriously poor record on pollution, poor wages, unsafe working conditions and long working hours. According to the United Nations Environment Programme (UNEP), 3,781 litres of water are used to make a pair of jeans, from the growing of the cotton to the delivery of the final product to the shop. Environmental compassion is seriously lacking in the fast fashion industry which produces ever-increasing numbers of designs each year with the aim of tempting us to buy more clothes. In 2014 the average consumer bought 60% more clothes than in 2000 but kept each garment for half as long. Crewe's (2008) revealing and shocking description of the life-cycle of a pair of stonewashed jeans and the working conditions in the sweat shops supplying high-street clothing chains, should be compulsory reading for students. Young people are now more aware and critical of the fashion industry and are creating alternatives. The *Vinted* and *My Wardrobe HQ* apps may be re-setting our attitude towards our wardrobes by valuing 'pre-loved' clothing and encouraging reuse and decluttering as more enduring lifestyles. The recently formed UN Alliance for Sustainable Fashion aims to help the clothing industry be more compassionate about its production chains by launching a variety of initiatives to reform the textile industry, from improving the durability of cloth to encouraging the development of new materials and natural dyes.

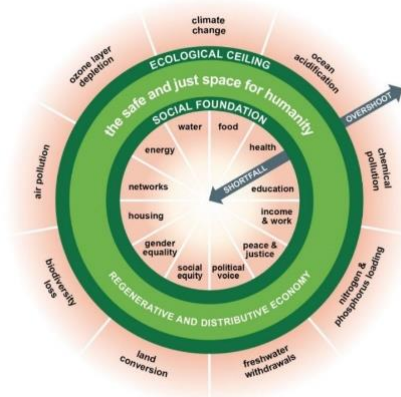


<https://blueocean.net/how-sustainable-fashion-is-impacting-shopping-behaviour/>

Building back better

Creating resilience within compassionate approaches can enable us to increase our ability to weather 'shocks' to our economic, health and environmental systems. Resilient systems require strong local communities who can make appropriate local decisions. Systems are not inherently compassionate; only people can understand the crisis of becoming homeless or not having enough food. Only the communities involved can assess the impact of the systems we create and make them work for all people. Governments, communities, and individuals are slowly starting to recognize the need for compassionate systems which can increase resilience and create a fairer and more sustainable society. or many years the 'corporates' have done much to earn their bad press. As one of the leaders in the corporate world, Unilever announced in January this year that by 2030 it will refuse to do business with any firm that does not pay at least a living wage to its staff. Alan Jope CEO of Unilever stated that "Without healthy societies, we don't have a healthy business". This is a brave step forward towards compassion in business by examining the entire nature of their supply chains.

Raworth (2017) argues that money intrinsically has no direct value to us as we cannot eat it etc, but it increases through interest if invested. She suggests that instead of valuing money we should invest in the tangible resources, both physical and human, which are needed to create a sustainable economy. Money should not just accumulate in banks but be actively used in the regeneration of public resources, such as hospitals and schools. The Doughnut Model of Economics, which sets out the minimum needs for human well-being, is being used by many UK local councils and in 2020, the city of Amsterdam adopted it as the basis of all public policy making. Many UK



<https://www.cec-managers.org/doughnut-model-compass->

county councils are also using this model as a framework for planning and developing ways to decarbonize and strive towards a zero-waste economy. For example, Cornwall has been granted a £4.2 million fund to retrofit 83 homes in a pilot project, with insulation, heat pumps, solar panels etc. the past specific community knowledge has often been ignored while making policies to tackle resilience.

However, things are beginning to change. In 2015 Crediton in East Devon developed a local flood strategy working with the University of Exeter. Residents in a 'competency group' were invited to



Photograph: Creative Commons

contribute their own knowledge in order to assess strategies for tackling river flooding in the town. This approach was able to overcome many of the current barriers to effective community resilience, which is often framed by a top-down approach to policy making. This is an excellent example of how risk management can effectively utilise local knowledge. Compassion is evident here through empowering local people as well as

respecting the local environment.

Going forward, the COP26 conference to be held in Glasgow in November this year will focus our minds on decarbonizing our economy here and around the world. Already there is a groundswell of change in business approaches, encouraged by the #RaceToZero networking that is taking place. There are many examples of new technologies and approaches which can give students hope that we really can make the changes needed to make our world work better and to make it fairer.



Scientists, geographers and economists across the world are developing compassionate approaches to our current challenges that value both our natural and human resources. It is our responsibility to examine and evaluate these approaches in our teaching and to emphasise the contribution of geography in these movements. It is one reason why we train as geographers. Young people are passionate about the world they live in and it is our job to help them to become its compassionate guardians of the future. The holistic approach of geography enables us to see the interaction between the human and physical world and it is our duty to help our students question the old models and evaluate how new ones might enable us to *really* value the planet and its people.

And in case you are still in any doubt, *geography really matters* now, more than ever!

The views expressed here are all the author's own.

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Decolonise, decolonialisation, decoloniality?

Iain Palôt

Following the Post16/HE CPD training with Global Learning London, we became more aware of a whole new vocabulary concerning decolonisation and its issues. Understanding this enables us begin to make sense of how to respond positively in the classroom, and how best to use the myriad of resources available to geographers.

Much of what has emerged from the tragic death George Floyd in the summer of 2020 has been an instant response to what is perceived as colonial and post-colonial injustice. We also need to address the underlying issues that seem to exist within the BIPOC community (Black and Indigenous People of Colour). The starting point must be an understanding and acknowledgement that everyone has their own unique experience of discrimination and oppression, and a consideration of everything and anything that can marginalise people, Kimberlé Crenshaw's concept of "intersectionality". From this follows a set of questions which could be addressed. In a group of students one might start with the obvious: "What do you understand by the term *colonial*?" This may produce a wide-ranging set of answers, with students contributing knowledge and understanding from other subjects as well as their lived experiences. No matter how uncomfortable the answers might prove to be, we must be alert and sensitive to different perspectives and encourage further points for discussion.

What is meant by the term *decolonise*? This is a process, but how can it be achieved? It's not solely about toppling statues and rewriting text books. What do students suggest?

Decoloniality on the other hand is a much wider perspective embracing and valuing plurality which includes more voices in the narrative.

There is a fundamental need to recognise the limitations of one's own identity and to involve people who have a different set of experiences, to show us what we can not, or have not, seen. These differences should not be seen as divisive but without recognising them we limit our ability to accept and celebrate differences in others.

We must ensure that we nurture diversity in our broad curriculum as well as our individual lessons. We must search for alternative ways to see experiences from different points of view. We need to critically reflect on whose knowledge system has been incorporated into the curricula and lessons; what has been included and therefore what has been excluded? As a result, who has been marginalised and why? Where are the silences and gaps in what is being taught, and who needs to be included? Who is preferred over others? And how can we create new resources, and use existing ones effectively to rectify the situation?

Much work is being undertaken within the GA, and elsewhere with GA support, and it is right that we should be involved at the start of a "project" that is going to take many years to make an enduring difference. But the longest journey starts with a single step and hopefully this is it.

Arctic climate change and the accelerating impacts of permafrost degradation

**Dr Richard Waller
University of Keele**

The last few years has seen a remarkable shift in the public awareness of the accelerating impacts of climate change, thanks in large part to the increasingly vocal efforts of young climate activists initially inspired by the lone actions of Greta Thunberg. As a consequence, 282 councils have to date declared a climate emergency and committed to the development of plans to reach net zero carbon emissions. Meanwhile, at the national level, there's increasing recognition that this November's COP 28 Climate Conference in Glasgow provides a final opportunity to set the world on a path that will avoid the most catastrophic impacts of future global heating.

Focusing on the rapid climate changes occurring within the Arctic and their wider environmental impacts provides a salient reminder of the immediate need to "bend the curve" and reduce global carbon emissions with immediate effect. Recorded land surface air temperatures for latitudes over 60°N during October 2019 – October 2020 were already 1.9°C higher than the 1981-2010 mean, demonstrating a sustained "Arctic Amplification" in the rate of warming. This coincided with record-breaking temperatures throughout the Arctic and a remarkable Siberian heatwave in the first half of the year with temperature anomalies of c. 6°C. This culminated in temperatures of 38°C in June that are the highest ever recorded north of the Arctic Circle, which in turn triggered over 18,000 wildfires affecting an area of almost 14 million hectares.

Looking offshore, it is the rapid loss of perennial sea ice in the Arctic Ocean that is one of the most rapid and visible environmental changes we are witnessing on Earth. In September 2020, the month of minimum sea ice cover, the average extent of sea ice was 3.92 million km². This is the second time a minimum extent of <4 million km² has been recorded and a value that equates to a longer-term average rate of loss of 82,700 km²/yr between 1979 – 2020. What is perhaps of even greater concern is the loss of older and thicker multiyear ice with volume of the oldest ice (>4 years old) having declined from 2.7 million km³ in March 1985 to 0.34 million km³ in March 2020. This means the sea ice reforming each winter is increasing dominated by thinner annual ice that is far more vulnerable to melting the following summer.

It is onshore however where some of the most dramatic recent changes have been observed as climate warming leads to permafrost degradation and regional-scale landscape destabilization. Increased summer warmth is increasing the depth of the active layer and an associated thawing of the upper part of the underlying permafrost. In regions of ice-rich permafrost, this can lead to "thermokarst" activity associated with the semi-permanent melting of the ground ice and thaw subsidence at the surface. This can in turn lead to the increased ponding of water at the surface and the establishment of a positive feedback loop with the low albedo of the ponds coupled with the high heat capacity accelerating further ground surface warming.

The most dramatic impact of this thermokarst activity has been the formation and rapid expansion of large retrogressive thaw slumps or "megaslumps" with headwalls up to 1 km in width. By 2005-10,

these were estimated to have caused major landscape disturbances over an area of 136,000 km² in the north-western Canadian Arctic with the rates of expansion increasingly exponentially. An aspect that has surprised researchers is the evolving “geography” of the related thermokarst activity, with the most extensive disturbance occurring in the High Arctic that had been assumed to be more resilient to climate change. This has highlighted the importance of the landscape’s glacial and environmental history with the regions most profoundly affected corresponding to areas of ice-cored moraine deposited during the last glacial period. The formation of permafrost in these areas as the ice sheet retreated resulted in “incomplete deglaciation” and the preservation of extensive relict glacier ice that has only recently started to degrade in response to Arctic climate change (Figure 1). In this case, it is the intensification of summer storm events and the associated fluvial erosion that has been most consequential, leading to the stripping of the surface sediments, the exposure of the relict glacier ice and its subsequent rapid thaw in the summer months. As the associated debris flows feed suspended sediments into major river systems such as the Mackenzie, there is the potential for significant impacts on freshwater ecosystems as one of several emerging wider implications.

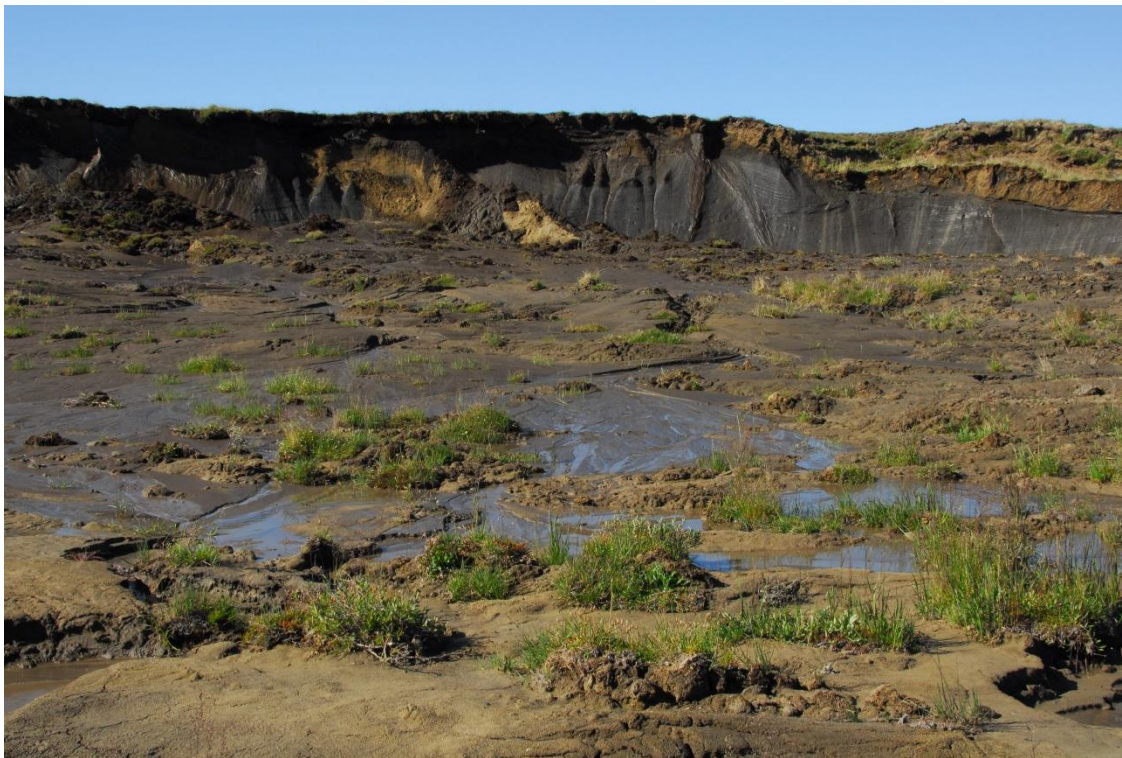


Figure 1: Exposure of relict glacier ice and associated retrogressive thaw slump in the Mackenzie Delta, western Canadian Arctic. (Image: RIW)

The impacts of climate-driven permafrost degradation aren’t limited to the regions in which it occurs. As one of the largest global stores of carbon amounting to an estimated 1400 billion tonnes, permafrost thaw and the decay of the preserved organic matter it contains has the potential to release significant amounts of carbon into the atmosphere as carbon dioxide or methane with global consequences. The release of increasing amounts of methane both from expanding thaw lakes and melting methane clathrates (ice-like solids comprising water and methane) is of particular concern. As a potent greenhouse gas (with 28-36 times the global warming potential of carbon dioxide), this

provides a major positive feedback and one of the potential tipping points that highlight the need for urgent action if we're to avoid irreversible change. However, the very same temperature changes and increases in carbon dioxide concentrations have the potential to drive negative feedbacks by enhancing vegetation growth a "greening" of the tundra. Whether the Arctic therefore remains a carbon sink or a developing carbon source remains the focus of considerable debate and ongoing research.

Recent realisations of a pressing need to decolonise our curricula, to recognise the limitations of European narratives and to afford greater recognition to the knowledge frameworks of indigenous populations are highly relevant to our attempts to understand the impacts of climate change on the Arctic as well as their wider consequences. Having retained an intimate connection with their natural environment through the continuation of hunting and gathering practices passed on from generation to generation, appreciating the knowledge and insights of the indigenous populations of the Arctic is more vital than ever. The formation of the Inuit Circumpolar Council, a greater representation of indigenous groups within the Arctic Council and the instigation of major research initiatives in which they set the agenda and co-produce the research data provide early signs that this is starting to happen.

Whether it be the mapping of thaw lake expansion, the measurement of carbon release from permafrost peatlands, or the community-led assessment of the impacts of climate change on subsistence food systems, geographers continue to play a key role in the exploration, assessment and mitigation of Arctic climate change. And as a bellwether of our wider attempts to address the existential threats posed by climate change, looking to the Arctic will provide a sobering check on our progress over the crucial decades to come.



COP26: Some food for thought.

Iain Palôt

In November 2021, the UK with their partners Italy will host COP26 in Glasgow.

This will be 26th United Nations Conference of Parties (COP) on Climate Change.

Background

The United Nations Framework Convention on Climate Change (UNFCCC) is an international environmental treaty addressing climate change. It was negotiated and signed by 154 states at the United Nations Conference on Environment and Development, informally known as the **Earth Summit**, which was held in Rio de Janeiro from 3 to 14 June 1992. It established a Secretariat headquartered in Bonn and entered into force on 21 March 1994. **The Kyoto Protocol**, which was signed in 1997 and which entered into force in 2005, was the first implementation of measures under the UNFCCC until 31 December 2020. The protocol was superseded by the **Paris Agreement**, which entered into force in 2016. As of 2020, the UNFCCC has 197 signatory parties. Its ultimate decision-making body, the **Conference of the Parties**, meets annually to assess progress in dealing with climate change.

The Paris Agreement has been much in the news, unfortunately for largely political reasons, as US President Donald Trump United States pulled out of the agreement. Lately his successor, President Joe Biden, has re-joined the coalition. In recent months and years, the main target that was agreed, to limit global warming to 1.5 degrees Celsius, seems for the most part to have fallen by the wayside. Currently only two countries are on track to meet this target, Morocco and The Gambia. Without further change, the four main emitters of carbon into the atmosphere, China, Saudi Arabia, Russia and the United States are on course to contribute to a rise in global temperatures of 4 degrees Celsius.

Nevertheless, some progress has been made despite the failure of COP25 in Madrid caused by disagreements over support for developing countries. 2019 was the year that saw widespread protests across the globe inspired by the Swedish school-girl Greta Thunberg and her preparedness to speak out in the face of sometimes extreme vested interest opposition.

As the delegates attend the postponed COP26, what is the current position?

Since the COP21 in 2015, over 120 countries, 1500 companies worldwide and hundreds of towns, cities and investors have committed to net-zero targets accounting for trillions of dollars. In fact, more than 50% of global GDP is included in these net-zero goals. In February 2020 the Bank of England launched its own COP26 finance agenda laying out proposals for a net-zero economy. The "Race to Zero" is a science based global initiative to engage businesses, towns and cities, regions, investors, schools, colleges and universities to commit to net zero emissions by 2050.

For its part, people in the UK continue to speak out. Through his compelling BBC programmes Sir David Attenborough has alerted the viewing public to not only climate change but its impact on ecosystems both marine and terrestrial. This message has been reinforced by Sir James Bevan, the CEO of the Environment Agency, who warned the Association of British Insurers annual conference that the climate emergency was already hitting “worse-case scenario” levels. He was at pains to urge politicians to take action to reduce emissions and adapt to the inevitable impacts of the emergency - extreme weather and flooding. Several of the anticipated worst-case examples of flooding have actually happened and each time the extent and depth of flooding get worse.

There is also a growing global campaign to criminalise ‘Ecocide’. Carbon in the atmosphere has now reached 417 parts per million [ppm], the highest figure for 3 million years. With the Paris agreement lacking, in the eyes of some, sufficient ambition, transparency and accountability, a new global crime of Ecocide will address a key cause of global climate change. President Macron and Pope Francis have both been prominent supporters of such a move along with the governments of Finland, Belgium and Spain.

[Ecocide derives from the Greek, “oikos” meaning home and the Latin “cadere” meaning to kill. Ecocide is therefore literally, “killing our home”.

COP26 Agenda

It is hoped that COP26 will be tackled unresolved issues of COP25 and reach a consensus on implementation, given added momentum by the rejoining of the USA in February 2021. Public expectations have grown over the past year as 2020 tied with 2016 as the hottest year on record, for average global surface temperatures. Extreme climate events and extensive and terrifying wildfires in California, the Amazon and Congo basins, Alaska and Siberia have drawn attention to the need for increased global action. So, the pressure for action from world leaders to address these issues and those of the resulting social injustices, is huge. At the COP26 launch on 3rd February, the UK Prime Minister pledged to bring forward a ban on petrol and diesel-fueled cars by from 2040 to 2035. This helps to kick-start the commitment, but is a small action among many others needed.

The UK government is working on five campaigns for COP26:

1. Adaptation and resilience: encouraging businesses and communities to build resilience.
2. Nature: to work with nature to protect and enhance it.
3. Energy transition: to enable businesses to move to carbon zero.
4. Clean road transport: to eradicate air pollution from traffic.
5. Investment in green policies and divest from fossil fuels. [Something the GA has already done]

Much greater collaboration will be needed to support global initiatives, such as the commitment to increased funding from some of the largest economies to support smaller economies. Similarly, in terms of foreign policy approaches, climate diplomacy and climate aid will need to be strengthened to ensure implementation globally.

All of this comes at a time when concerns over the UK government’s green credentials are under pressure as it refuses to withdraw support for a new coal mine in Cumbria. As James Bevan said, the government, and the public, need to put in the same effort that has been evident in tackling the COVID crisis into fighting the unseen pandemic of the climate emergency.

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