

[ch]Editorial: Visualising climate change

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Geographical research makes change *visible*. This is a powerful aspect of what geography offers society. Being able to describe change in the world, and visualise it, helps us *understand* its pace and how it varies. Not content with that alone, many researchers also work towards solutions that can make a *difference*. Put these together and you can see why geographers are set to make a significant contribution to the 26th UN Climate Change Conference of the Parties (COP26) in Glasgow in November 2021.

The conference will see governments, businesses, trade unions and charities meet for 12 days of talks. Drawing on the latest Intergovernmental Panel on Climate Change (IPCC) reports, they are set to build on the 2015 Paris Agreement. The goal is to update nations' commitments to meet the urgent challenge of addressing runaway climate change.

This issue of *Geography* traces the ways that change – particularly climate change – is being measured and its impacts seen. It illustrates the power of the visual in geography – from white ice to green grass; of clusters, models and figures; and seeing beyond the blue-green globe. As the world's attention turns to Glasgow, through these pages we can turn our attention to the world. As artist Alisa Singer put it 'As we witness our planet transforming around us we watch, listen, measure ... respond' (IPCC, 2021).

In the first main article, Rachael E. Carver and Fiona S. Tweed look at the **dilemmas facing ski tourism in a deglaciating world**. Glaciers act as visible and measurable barometer of climate change. Deglaciation is already impacting on water security and power generation, and increasing the likelihood of natural hazards such as floods and mudflows. Glacial environments are also important to local economies due to tourism, including visits to glaciers themselves and activities such as skiing. Carver and Tweed explore how communities reliant on tourism income are responding to these changes, and consider adaptive strategies across the short, medium and long term. It is notable that some strategies (e.g. providing helicopter tours and using artificial snow) themselves contribute to the problem. As many of the short-term strategies are becoming less effective, so more radical changes are being explored. Will the future for tourists include grass skiing?

From the changing colours of landscapes we turn to the changing geographies of the high street with Tim Hall, Peter Jones and Grace Nash-Williams' article, which adds important nuance to the geographies of **high-street betting shops**. Here, visualisation highlights the extent of betting shop clustering and the relationship of their location to indices of deprivation. This is set in the context of a general decline in betting shops. In a nod to the value of taking a long-term view, the article updates the work submitted by one of the authors (Peter Jones) to the journal more than 25 years ago.

Drawing on a presentation given to the Geographical Association Annual Conference in 2021, Jeremy Williams argues about the necessity of making the **racial injustice of climate change visible**. While the symbol of the blue-green marble Earth is used the world over, it projects a static European picture of green lands across the globe. One effect is that it omits the colours of the most vulnerable places on Earth. However, the visible and invisible inequalities of climate change are not evenly distributed or experienced. They fall more heavily on people of colour, while historic emissions are centred in majority white countries. Williams calls for greater attention on the perspectives of people of colour in climate discourse.

In a Challenging Assumptions article, Aideen Foley takes a step back to consider the different uses of climate models and the benefits of thinking about the narratives that underpin their projections. Foley highlights an important mismatch between the scale of grid cells considered by global climate models and the scale at which information is needed to inform local decision-making about adaptation, for example on an island such as Mauritius. Combining community involvement with downscaled models offers one approach to enable **climate models to serve community needs**.

Caroline Clason, Sally Ramagecroft, Gina Kallis, Shaun Lewin and Tom Muller contribute a Spotlight on... article highlighting how we can **explore the Andes' vanishing glaciers with GlacierMap**. They stress the significance and sensitivity of tropical glaciers to both local communities and the Earth system. While glaciation options at GCSE and A level may have had a lower take-up compared to a topic such as coasts, initiatives like GlacierMap allow students consider the urgent present-day implications of glacier retreat. These tools and the research that informs them make visible important aspects of geography that may previously have been less accessible.

Finally, Matthew Ball, an undergraduate geographer, describes how **deep-sea sediments and ice cores provide a record of Quaternary climate change**. As well as providing a basis for reconstructing past climatic conditions, they allow for the accuracy of climate models to be tested. As this is an evolving field, new techniques (e.g. considering magnetic susceptibility) expand the research questions being explored. This article illustrates the level of work that goes into producing the data and analysis that underpins all the research discussed in this issue. Considering the ways in which data and analysis are produced helps to highlight important limitations, as well as grounds for confidence in the conclusions reached.

Taken together, the articles in this issue report important and urgent information about geographical change, especially climate change, and the ways in which communities are responding. Illustrated in these pages you will see evidence of the power of geographical research to make particular phenomena visible, to understand them, and to consider how communities – including geographers – can make a positive difference.

#### [A]References

IPCC (2021) *Sixth Assessment Report*. Available at <https://www.ipcc.ch/report/ar6/wg1/> (last accessed 9/9/2021)