BIODIVERSITY

Stream temperature velocity

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Mountain dwelling species are often characterized as being particularly vulnerable to climate change as their capacity to move to maintain their thermal habitat is limited. Movement is particularly constrained for aquatic species that have to follow channel networks, possibly making them even more susceptible to temperature changes.

Daniel Isaak from the US Forest Service, Rocky Mountain Research Station and co-workers use a large water-temperature database from the northwestern US to develop thermal habitat information for a 222,000 km stream network. They find average stream warming rates (for the period 1968–2011) of 0.1 °C per decade and a median climate velocity (the velocity needed to maintain constant temperatures) of 1.07 km per decade. In response to these changes many cold-water vertebrate species occurred in a part of the network characterized by low climate velocities. Even the aggressive warming scenarios that the authors investigated are expected to result in low climate velocities in headwaters because of strong local-temperature gradients. Consequently, mountain streams may be well placed to preserve biodiversity in the face of climate change. *AB*

ENVIRONMENTAL SOCIOLOGY

Home base

Int. J. Just. Sustain. http://doi.org/bd33 (2016)

Many studies explore how households will need to change their behaviour if they are to reduce emissions. However, such studies rarely explore how the dynamics of a household, as a social unit, affect the chances of people acting in a climate-friendly way.

Lesley Head from the University of Melbourne and colleagues from the University of Wollongong, Australia, conduct a meta-ethnography of studies exploring 276 households' responses to environmental challenges.

They found that family dynamics remain the key driver of household decision making, suggesting that appeals to the shared value of 'the family' could be used to overcome politicization around the issue of climate change. They also found that concepts such as 'saving time' and 'autonomy' were unlikely to be sacrificed by households in the name of reducing emissions. Households demonstrated strong adaptive capacities, however, meaning it is likely they would find ways to cope if they were required to modify behaviour.

Understanding households as these more heterogeneous units could help policymakers to bridge the gap between people's environmentally friendly attitudes and their carbon-intensive actions, and see people act for reasons beyond environmental concern. *MH*

IMPACTS

Weather experiences

Nature http://dx.doi.org/10.1038/nature17441 (2016)

Climate change is often intangible to the general public and individuals have more understanding of the local weather than the global climate. If their weather experience is positive, they may be less concerned about climate change. In the USA, climate change has resulted in most regions becoming more temperate, as the winters have warmed, and temperate climates are preferred locations to reside.

Patrick Egan of New York University, USA and Megan Mullin of Duke University, USA develop an index of personal weather preference and investigate current and future weather experiences of the US population. They report that at present, 80% of the population are living in counties where the weather is better than it was 40 years ago — with warmer winters, but no experience of excess heat or humidity in summer. This indicates that as climate change reporting has risen, most Americans have experienced more pleasant weather, which may reduce motivation to act.

However, projections under a high emissions scenario suggest that 88% of the population will experience weather less preferable by 2100, compared to recent times. The impact of increasing summer temperatures will exceed that of winter warming, causing less pleasant living conditions. Such a change in personal experience may increase public pressure to act on climate change. *BW*

METHANE EMISSIONS

Siberian Shelf estimates

Atmos. Chem. Phys. **16,** 4147–4157 (2016)

Increasing temperatures in the Arctic could accelerate the thawing of the subsea permafrost in the East Siberian Shelf, releasing large amounts of methane — a potent greenhouse gas — into the atmosphere. Previous estimates based on oceanographic observations suggest massive emissions from these shelves, but this remains controversial due to the large uncertainty associated with the methane fluxes partly due to their large spatial and temporal variability.

Antoine Berchet, from the Institut Pierre Simon Laplace in France, and colleagues used a top-down approach and combined atmospheric methane observations with high-resolution transport and mixing simulations to resolve the seasonal cycle of these emissions and evaluate the potential for such large emissions from the Siberian Shelf.

The analysis suggests that large methane emissions are possible in the summer, but not during the rest of the year, indicating that previously suggested annual rates cannot be sustained over this area. The method used suggests that the range of methane emissions from the Siberian Shelf is 0.0–4.5 $TgCH_4\ yr^{-1}$, significant at the regional scale but 6–10 times smaller than most recent estimates (8–17 $TgCH_4\ yr^{-1}$).

Although the biases associated with the model used need to be addressed, this new analysis highlights the need to constrain the spatial and temporal variability of methane emissions in this region to reduce the uncertainties in the fluxes. *ET*

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