

research highlights

DECARBONIZATION

Dark side of low carbon

Glob. Environ. Change <https://doi.org/10.1016/j.gloenvcha.2019.102028> (2020)



Credit: Marion Kaplan / Alamy Stock Photo

A transition to a low-carbon economy is necessary to reduce greenhouse gas emissions and limit warming. The need to decarbonize has led to an upsurge in innovation in the energy, transport and technology sectors, with low-carbon electricity and electric vehicles gaining popularity as alternatives to fossil fuel use. But the growing interest in these new technologies comes with increasing demand for minerals and metals, as well as the need to recycle and dispose of electronic waste.

Benjamin Sovacool from the University of Sussex, UK and colleagues analyse the impact of the rising demand for low-carbon technologies on countries responsible for extraction of raw materials and disposal. They use case studies from cobalt mines in the Democratic Republic of Congo and electronic waste processing in Ghana. Through a combination of interviews and

site visits, they find that decarbonization enhances existing vulnerabilities in the Global South, contributing to environmental degradation, ethnic and gender discrimination, and child labour. A suite of local and global policies is therefore required to ensure a just energy transition. **AF**

<https://doi.org/10.1038/s41558-020-0724-1>

PUBLIC PERCEPTIONS

Beyond Western views

Environ. Commun. <https://doi.org/10.1080/17524032.2019.1699137> (2020)

Climate change is a global concern, yet most research on public perceptions of climate change and acceptability of potential solutions is conducted with respondents from the Global North or from Western democracies. However, there are cultural differences in public attitudes toward climate change between the East and West. A focus on the Global North excludes those most vulnerable to climate change impacts, who may consequently be more willing to experiment with more controversial mitigation options.

Masahiro Sugiyama from the University of Tokyo, Japan and colleagues surveyed college students in six Asia-Pacific countries. They found that most believed that human-caused global warming was occurring, and that more serious mitigation efforts are needed despite potential economic consequences. Although students from the Global South (China, India, the Philippines) were more positive towards geoengineering as a potential option and favoured more immediate deployment than those in the Global North (Australia, Japan,

South Korea), there was broad agreement on the need for research governance. This study highlights the importance of soliciting non-Western perspectives to promote inclusive global discourse. **JR**

<https://doi.org/10.1038/s41558-020-0725-0>

STRESSED PLANTS

Doubled genome an asset

Plant Biol. <https://doi.org/10.1111/plb.13094> (2020)



Credit: NSP-RF / Alamy Stock Photo

Polyploidy, the condition of having more than two complete sets of genomes, has been an important evolutionary mechanism for flowering plant diversification. Polyploids often occur in more variable or extreme habitats than their diploid progenitors (those with two chromosome sets), leading to the hypothesis that the expanded physiological and morphological variation found in polyploids may make them more competitive under changing climates.

Amelia Stevens and co-authors in Canberra, Australia, studied diploid and tetraploid kangaroo grass (*Themeda triandra*) plants to investigate the influence of within-species ploidy variation on early establishment traits. Compared with diploid plants, tetraploids generally had heavier seeds and a higher proportion of dormant seeds, and they developed heavier and taller seedlings. Tetraploid seeds also had lower germination under drought and temperature stress. Together, this suggests that tetraploid seeds may be more resilient to long unfavourable periods, and quicker to establish when conditions are good. These results have important implications for current grassland restoration efforts, as well as for the continued fitness of this species and grassland ecosystems under long-term climate change. **TAM**

<https://doi.org/10.1038/s41558-020-0726-z>

Tegan Armarego-Marriott, Alyssa Findlay, Baird Langenbrunner and Jenn Richler

PHYSICAL OCEANOGRAPHY

Ocean-driven Arctic warming

Geophys. Res. Lett. <https://doi.org/10.1029/2019GL086706> (2020)

Arctic temperatures are increasing at more than twice the global rate. This is attributed in part to the surface albedo feedback, in which melting of snow and ice exposes the underlying land and ocean, and these darker surfaces absorb more sunlight and amplify warming. Changes in the atmospheric temperature structure and moisture content, as well as enhanced northward heat transport into the Arctic Ocean, are also at play, although the oceanic mechanism is not well understood.

Emma Beer at the Scripps Institution of Oceanography, University of California San Diego, USA and colleagues use an idealized climate model to study ocean-driven Arctic amplification. In response to long-term greenhouse gas forcing, the Arctic Ocean warms at depth, but where sea ice persists, the near-surface waters remain close to freezing. The authors find that these changes cause a larger vertical temperature gradient in the ocean, enhance vertical and horizontal heat flux, and thin the sea ice above. This mechanism evolves seasonally and, paradoxically, highlights a route for Arctic amplification that relies on the presence of sea ice rather than its absence. **BL**

<https://doi.org/10.1038/s41558-020-0730-3>