EPIDEMIOLOGY

Mosquitos on the march

PLoS Negl. Trop. Dis. **13**, e0007213 (2019).

Credit: Poravute Siriphiroon / Alamy Stock Photo

Climate change is expected to severely exacerbate the risk and burden of viruses transmitted by *Aedes* mosquitos, including dengue, Zika and chikungunya. This is very concerning for public health and further work is required to elucidate the complex physiological and epidemiological relationships between these viruses, their mosquito vectors, and the environment, and implications for future disease risk.

Sadie Ryan at the University of Florida, United States, and co-authors apply a mechanistic model of the distribution of *Aedes-aegypti*- and *Aedes-albopictus*-borne viral transmission to simulate the role climate change might play in redefining the geography of these diseases.

In the worst-case scenario, they find that within the century nearly a billion people will be threatened with new exposure to virus transmission by both *Aedes* species. However, transmission dynamics are complex, primarily due to *Ae. aegypti* being more heat tolerant than *Ae. albopictus*. Interestingly this means that the most extreme increase in *Ae. albopictus* transmission occurs at intermediate climate change scenarios and decreases under the highest climate change scenario, when temperatures reach a level that begin to reduce disease transmission. *AB*

https://doi.org/10.1038/s41558-019-0470-4

CONSERVATION

Land protection benefits

Conserv. Biol. http://doi.org/gfxh6w (2019).

Credit: James M. Hunt / Alamy Stock Photo

Protecting forests and wildlands is an important strategy for mitigating climate change, as well as providing clean air and water, recreation and forest products. However, land protection by definition limits extensive resource extraction and the conversion of land to commercial and residential use, and consequently faces opposition due to a perceived incompatibility with local economic growth.

Katharine Sims, of Amherst College, United States, and Jonathan Thompson, of Harvard University, United States, and co-authors investigate the local impacts of land protection on economic activity in 1,501 New England towns and cities, spanning a 25-year period from 1990–2015. Using a quasi-experimental impact-evaluation approach, they find that land protection led to a small, but statistically significant increase in employment and the size of the labour force. The employment gains are likely attributable to a growth in recreation-based jobs and local amenity values. Notably, public and private protection had positive impacts on employment, suggesting possible economic benefits from employing a mix of conservation efforts. *AY*

https://doi.org/10.1038/s41558-019-0471-3

BIOGEOCHEMISTRY

Fen drying versus warming

Glob. Change Biol. http://doi.org/c39p (2019).

Approximately 500 gigatons of carbon are stored in northern peatlands. Because subsurface aeration plays a significant role in peatland carbon cycling, understanding the interactions between soil moisture and climate warming has implications for the amount of mineralized peatland carbon. This is particularly important in peatland types found in areas expected to experience high rates of climate warming, as an increase in mineralization will accelerate climate change.

Anna Laine, of the University of Eastern Finland, and colleagues tested the impact of climate warming on peatland carbon mineralization under natural and decreased moisture conditions. They tracked photosynthesis, respiration and net CO_2 exchange in two Finnish fens subjected to warming and water-level drawdown over two growing seasons. While warming had little effect, dryer conditions were associated with increased photosynthesis and respiration, and together warming and drying decreased CO_2 uptake in one site. This suggests that peatland CO_2 exchange is more strongly influenced by drying than warming, and that soil moisture may be critical to determining whether fen systems are able to adapt to a changing climate. *LZ*

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CLIMATE DYNAMICS

A stronger South Asian monsoon

Geophys. Res. Lett. http://doi.org/c39n (2019).

In response to warming, Earth system models project an increase in South Asian monsoon (SAM) rainfall and intensity, while observations depict a decrease since the 1950s. Reconciling this discrepancy has proven difficult, owing to uncertainty in regional precipitation records and aerosol impacts.

Sean Bryan, from Colorado State University, United States, and colleagues used Red Sea corals along the Saudi Arabian coast to reconstruct a proxy for SAM intensity over the past 250 years. They did this by measuring annual barium/calcium ratios (Ba/Ca), which reflect dust deposition into the Red Sea. Broader SAM circulation is associated with winds that blow dust from the Sudanese desert east over the Red Sea, and corals incorporate dissolved barium. The authors found an increase in Ba/Ca, which suggests an increase in SAM intensity, over the past 250 years. They attribute this increase to northern hemisphere warming, though they note a decrease in multidecadal variability in the latter half of the record. These results fit with the understanding that monsoons will generally strengthen in a warming climate. *BL*

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