CONSERVATION

Two birds with one stone

Ecol. Lett. http://doi.org/ch6f (2018)

Credit: Michael Dwyer/Alamy Stock Photo

Habitat destruction and climate change are two of the greatest threats to life on Earth. Tackling these threats requires the protection of habitat in biologically diverse areas, as well as preservation and restoration of areas with high carbon stocks. It would therefore be very convenient if high carbon stock areas also tended to be highly biologically diverse. However, evidence for a positive association between carbon density and species richness is mixed.

In an effort to understand the diversity in the literature, Moreno Di Marco from CSIRO Land & Water, Australia, and co-authors test how carbon density and species richness correlate at different spatial scales and as a function of dependence on a number of environmental variables. They find that the correlation is strong at large spatial scales and becomes weaker at smaller scales. At the ecoregion level correlations are highly variable, but there are opportunities to pursue local carbon conservation with high biodiversity when both species richness and carbon density vary as functions of the same environmental variables (such as temperature, rainfall, soil and elevation). This condition occurs in about 20% of tropical ecoregions. Other ecoregions however require careful planning for both biodiversity and carbon conservation, to avoid potentially perverse outcomes. *AB*

https://doi.org/10.1038/s41558-018-0075-3

CLIMATE MODELLING

A model revolution

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While considerable progress has been made in our understanding of the climate system, projections of the future remain highly uncertain. Such relatively low confidence stems, in part, from uncertainties in the parameterization schemes of Earth system models (ESMs) — approximations of unresolved small-scale processes — including, for example, cloud dynamics. Tapio Schneider and colleagues from the California Institute of Technology, USA, envision a revolution in Earth system modelling using data assimilation and machine learning to improve parameterization schemes.

With recent advances in computational tools, it is suggested that ESMs may soon be able to actively optimize parameter estimates. This can be achieved by harnessing global observations and targeted high-resolution simulations, for example in regions where parameterizations are particularly uncertain. In comparison to the traditional approach, this machine-learning-based method would systematically improve parameterizations, and in turn, reduce projection uncertainty. However, before this revolution can be achieved, advances are needed in learning algorithms, and the parameterizations themselves must be re-designed to allow for refinement using data from various sources. Nevertheless, the vast advances in computational resources may mean the re-engineering of ESMs may not be too far from realisation. *GS*

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CLIMATE CHANGE PREDICTION

Preference for extreme outcomes

J. Exp. Psychol. Appl. **23**, 386–402 (2017)

Because climate change projections are based on past climate data and future assumptions, they are not certainties. Rather, projections are used to derive probabilities of climate change outcomes. The IPCC provides specific guidelines for communicating outcome likelihood, mapping verbal probability terms ("unlikely") to specific numerical likelihoods (0–33%). However, these guidelines do not account for biases in the way people use and understand probability information.

Marie Juanchich and Miroslav Sirota from the University of Essex examined how people form climate change predictions based on frequency distributions. When asked to make predictions about "unlikely" or "possible" sea-level rise by 2100 based on a distribution of 100 projections, participants generally selected extreme maximum outcomes. Participants also rated the outcome they chose as 20–35% more likely than that outcome's actual probability. Predictions were less extreme when verbal probability terms were replaced with or accompanied by numerical probability values, but this did not reduce the gap between prediction frequency and perception of its probability. These results suggest that people have a preference for predicting extreme outcomes from climate change and overestimating their occurrence. *JR*

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DEVELOPMENT POLICY

Mainstreaming adaptation

Environ. Sci. Policy **81**, 36–45 (2018)

Credit: Costas Dumitrescu/Alamy Stock Photo

The potential impact of climate change on developing countries has led to calls for mainstreaming climate concerns in development policy. The European Union (EU), as both a large international donor and climate leader, has committed to integrate climate change adaptation (CCA) into foreign aid projects. How, and if, this commitment is sustained across the policy cycle remains underexplored.

Frederik De Roeck and colleagues from Ghent University combine document analysis with semi-structured interviews with EU officials and country delegates responsible for delivering foreign aid to better understand how CCA is being integrated into development planning and implementation processes in the current aid cycle (2014–2020). They find that the EU Commission has partially integrated CCA and EU aid activities, focusing primarily on win–win solutions in sustainable agriculture, food security and rural development sectors. However, a lack of human resources has limited the use of an extensive toolbox for evaluating policy impacts and climate risks. Thus, despite the EU Commission's effort to mainstream CCA, policymakers are not yet fully designing projects through a climate lens. *AY*

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