

INTERNATIONAL RELATIONS

US climate leadership

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Credit: Agencja Fotograficzna Caro/Alamy Stock Photo

The decision by the US to withdraw from the Paris Agreement has led critics to lament the end of America as a global leader, begging the question of what the country's climate leadership role was to begin with.

Charles Parker and Christer Karlsson of Uppsala University examine American leadership strategies and whether the US was recognized as a leader in UN climate negotiations. Their analysis of US submissions to the UNFCCC process and statements by key officials reveals that the US provided a vision for the agreement's hybrid design, signalled its own commitment to domestic climate action and helped bring about Chinese cooperation through bilateral partnership. Surveys conducted at eight COP sessions show that climate leadership was generally shared between the US, China and the EU, but recognition of the US as a climate leader

peaked during the Copenhagen and Paris meetings; on both occasions the US was the most recognized leader.

Although US climate leadership has been criticized for being deficient, the authors argue it was crucial to making the Paris Agreement possible. AY

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BEHAVIOURAL ECONOMICS

Paying for lasting conservation

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To reconcile the tension in low-income countries between financial gains for clearing local forests and climate regulation benefits of preserving trees, programmes that compensate individuals for lost income if they do not cut down trees have been proposed. However, monetary incentives may undermine pre-existing motivations to conserve forests, and thus render conservation efforts dependent on the intervention in the long term.

Krister Andersson from the University of Colorado, Boulder, and colleagues conducted an experiment in which forest users from rural villages near tropical forests in Bolivia, Indonesia, Peru, Tanzania and Uganda played a common-pool resource game framed in terms of local forest conservation. Introducing bonus payments for conservation reduced hypothetical tree harvesting levels in the game relative to the pre-treatment rounds. Importantly, players continued to conserve more than in the pre-treatment rounds when payments were subsequently removed. Conservation during and following the payment intervention

was even higher when participants were also able to communicate with other group members. These results suggest that monetary incentives encouraged forest users to cooperate in the service of conservation, even after payments were discontinued. JR

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PHYSICAL OCEANOGRAPHY

Humboldt upwelling

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Credit: Kevin Schafer/Alamy Stock Photo

The Humboldt current system — which flows equatorward along the western coast of South America — is a region of strong wind-driven coastal upwelling, the nutrient-rich waters of which fuel extensive biological production. Several studies suggest that Humboldt upwelling will increase in the future due to an intensification of upwelling-favourable winds, but there is contention regarding the robustness of these projections. Damián Oyarzún and Chris Brierley from University College London, UK, investigate future spring-time upwelling in the Humboldt system using a direct estimate of upward ocean mass transport (as opposed to a wind-driven proxy) from 13 coupled general circulation models forced with a strong warming scenario (Representative Concentration Pathway 8.5).

Consistent with previous studies, increased wind stress is found to drive stronger upwelling at the surface (>50 m) by the end of the twenty-first century. Below 100 m, however, a disconnect with wind stress is apparent; coastal upwelling is projected to decline, attributed to enhanced stratification due to warmer ocean temperatures. Such reductions in upwelling could have considerable ecological impacts in one of the most productive ecosystems in the world, and highlight that future projections should consider a synergy of both atmospheric and oceanic factors. GS

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CLIMATE IMPACTS

Mis-prioritizing conservation?

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Resources for conservation are limited and there is therefore much demand for information about where these scarce resources would be most effectively employed. Climate and other global change factors complicate these prioritization exercises further because they mean that the past is often a poor indicator of the future. The most common tool used for investigating the impacts of climate change for groups of species is correlative species distribution models (SDMs), which remain popular despite longstanding questions about realism and reliability.

Helen R. Sofaer from the US Geological Survey, Fort Collins Science Center, Colorado, and co-authors evaluate whether SDMs can reliably rank changes in the range sizes of North American birds under climate and land-use change. To do this they fitted ensembles of SDMs to historical bird survey data to simulate occurrences for recent years based on around 35 years' worth of observed climate and land-use data.

Comparing simulated with observed patterns of range loss and change in range size they found that the SDMs were poor predictors of the relative vulnerability of species to climate and land-use change. These findings indicate that correlative SDMs based on generic covariates across many species have limited utility for spatial conservation planning. AB

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