

The eco-climate nexus

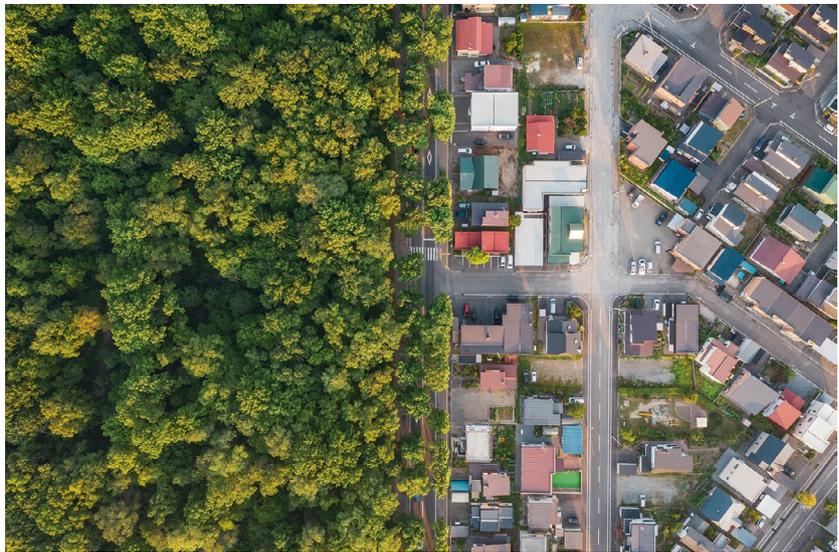
Ecosystems, and the services they provide, can support climate mitigation and adaptation, yet also suffer from climate change impacts. Now, discussions surround how to best support the eco-climate nexus, overcoming the challenges ahead and creating multiple benefits.

Climate change is becoming one of the most prevalent threats to ecosystems, impacting individual species and the interactions between them. By shifting the function or pattern of ecosystems, climate change impacts can lead to degradation of ecosystem services, jeopardizing the value of ecosystems for people's well-being.

Conversely, well-managed ecosystems could provide effective and feasible solutions to the increasing climate threat, so-called Nature-based Solutions (NBS). These NBSs have been proposed to increase carbon stocks, or to avoid further greenhouse gas loss from soils, forests and oceans¹. These approaches include conservation and restoration, with associated ecological, social and economic benefits. In their Article, Bertram and colleagues estimate that Australia alone could generate a positive net benefit of about US\$22.8 billion per year through coastal ecosystems' carbon services, based on the country-specific social cost of carbon². Further, ecosystem-based adaptation is becoming a common tool to help people to adapt to climate change, for example through natural flood management or green space creation³.

However, when people hear the term 'ecosystem services', they usually imagine wild forests, wetlands or coastal coral reefs. Such a misconception is also reflected in NBS planning, which often targets photosynthesizers. But the potential of ecosystem services in climate action could be much broader. Writing in a [Comment](#) in this issue of *Nature Climate Change*, Berzaghi and colleagues suggest that the carbon offset provided by wild animals should be highlighted. Incorporating these services into the existing carbon credit markets could potentially address the financial gap in both biodiversity conservation and climate action, although many scientific, political and legal challenges need to be overcome.

Beyond wild and remote habitats, urban ecosystem services are also an important component in the eco-climate nexus, and could directly impact human well-being. More nature-focused urban planning could effectively help people to better adapt to climate change impacts and to improve their physical or mental health. In their [Comment](#) in this issue, Pedersen Zari



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and colleagues discuss how the concept of 'regenerative living cities', including green (relating to living vegetation and soil), blue (relating to water), or hybrid infrastructures and integrated vegetation, will support urban biodiversity, human well-being and resilience to climate change.

Although the significance of ecosystem services on climate impact and action is widely acknowledged, when it comes to real-world practices, the pace is still slow. For example, the climate damages on ecosystems are usually not accounted for in the social cost of carbon calculations due to the difficulty in precise and correct valuations. In another [Comment](#) in this issue, Druckenmiller writes about the specific technical challenges that prohibit the inclusion of ecosystem valuations into climate policy. Also discussed are the recent advances in data accessibility and methodological innovation, and how these advances could help researchers and policy professionals to better integrate ecosystem services into climate action.

It is widely agreed that the expanded application of ecosystem services will not come without costs and will not be able to solve all problems. In fact, there are many concerns around the potential for abuse of the concept and to undermine efforts

in other sectors. Poorly designed plans or estimations could divert attention away from energy decarbonization, and may even harm local communities⁴. Thus, we need to pay particular attention to prevent ecosystem services from becoming a distraction and overshadowing the real efforts being made in climate mitigation and adaptation.

To get this right, we need to align ecosystem services and climate action with broader socioecological objectives. As Fankhauser and colleagues write in their Perspective, we should move away from the narrow carbon-offset paradigm and ensure that the ecosystems involved in any climate policy are sustainable and wide-ranging, and that solutions are designed in collaboration with local Indigenous communities⁵. □

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References

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