

## ECOLOGY

# The Amazon region

The Amazon region—roughly equivalent to the 48 contiguous U.S. states—includes an enormous forest brimming with biodiversity and many other habitats, from expansive wetlands to canopy communities. Research to date has already documented the value of the region to planetary health, although much remains to be studied. However, the information available now is sufficient for allowing scientists and policy makers to address critical questions about the health and sustainability of region today: What is the role of the Amazon as a global carbon stock, how is the region faring under human pressures, and what are the implications of continued habitat and biodiversity loss. This collection of five papers published in *Science Advances* are powerful samples of the science needed to understand and, perhaps, address current threats to Amazonian biodiversity and habitats.

We include an impressive analysis by Haddad *et al.* (1), synthesizing experiments of habitat fragmentation conducted over 35 years (the oldest of which is in the Amazon north of Manaus, started 1979), across five continents and a variety of scales and biomes. The results show that biodiversity within forest fragments is reduced up to 75% and that 70% of the remaining forest in the world is within 1 km of an edge. The ter Steege *et al.* (2) study shows that, under projected trends of continuing deforestation, up to 57% of all Amazon tree species are likely to become globally threatened, including rare species. Research by Chazdon *et al.* (3) on the regrowth of secondary forests found that natural regeneration of second-growth forests, in tandem with sustainably managed forests and curtailed deforestation, could provide a low-cost route to high-carbon sequestration.

We have also included two 2017 papers that highlight situations of habitat and biodiversity loss fueled by expanding human populations and other anthropogenic drivers. First, a study of forest disturbance, by Tyukavina *et al.* (4), documents the extensive combined loss of primary and nonprimary forest between 2000 and 2013 across the Brazilian Amazon. Second, by Estrada *et al.* (5), is that about 60% of primates worldwide are threatened with extinction and 75% have declining populations, and many of them are in the Amazon.

Because of its size and importance to the overall health of the planet, protection of Amazonian habitats and abundant plant and animal life is increasingly important. This is particularly true because we better understand the role of the region in terms of global carbon stocks and hydrological cycles.

I hope that this collection will serve as a starting point for readers for further exploration of the Amazon's resources and the potential consequences of continued habitat destruction and declining of biodiversity. In addition, I hope the collection will drive new questions that can help students, stakeholders, policymakers, and the public appreciate and eventually preserve the wondrous resources of the Amazon.

– Thomas E. Lovejoy

## REFERENCES

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3. Chazdon *et al.*, Carbon sequestration potential of second-growth forest regeneration in the Latin American tropics. *Sci. Adv.* **2**, e1501639 (2016).
4. Tyukavina *et al.*, Types and rates of forest disturbance in Brazilian Legal Amazon, 2000–2013. *Sci. Adv.* **3**, e1601047 (2017).
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**Special Collection on the Amazon.** The Amazon region covers about 40 percent of South America and influences the many countries and cultures that it covers, from Bolivia to Brazil, Columbia, Ecuador, Guyana, Peru, Suriname, and Venezuela. The region holds among the world's great riches in both plant and animal biodiversity and provides the planet with vital resources for sustained planetary health. This collection of research articles, and the overview provided by pre-eminent scholar and Amazonian expert Dr. Thomas Lovejoy, bring together powerful documentation of the threats to the region's resources and the potential consequences of their loss.



Thomas E. Lovejoy,  
Department of  
Environmental Science  
and Policy, George  
Mason University,  
Fairfax, VA 22030, USA.  
Email: tlovejoy@  
unfoundation.org

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Thomas E. Lovejoy

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