>> SYNTHESIZE MOUNTAINS OF KNOWLEDGE <<

Submitted Abstract

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Abstract

Biodiversity is not randomly distributed. We have long been aware that certain assemblages of species tend to co-occur, giving rise to hierarchical classifications of biodiversity from ecoregions to biomes. Ecoregions in particular are frequently used in conservation analyses and protected area planning as a proxy for biodiversity representation. However, these analyses generally treat ecoregions as static. Yet at the same time, there is an abundant literature on the projected changes of the distributions of individual species and guilds of species in the context of climate change. This is particularly relevant in montane regions, where the velocity of climate change is expected to be highest with large resulting perturbances to biodiversity assemblages.

The Panj-Amu River Basin of northeast Afghanistan is a topographically complex region comprised of a mixture of grassland, forest and desert ecoregions, the specific ecological contexts of which are critical to supporting the livelihoods of the area's communities. Using high-resolution downscaled models, we show that large areas of this landscape are expected to transform over the coming century, both at the ecoregion and the biome level. These findings highlight the need to explicitly consider climate change and adaptation in conservation planning analyses that incorporate ecoregions as measures of representation. These findings also highlight the precarious nature of the connection between ecological context and human livelihoods, and create a spatially explicit pathway for better understanding local vulnerabilities in the face of a changing world.