Submitted Abstract

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Abstract

Although protected areas (PAs) play an important role in ecosystem conservation and climate change adaptation, no systematic information is available on PA protection of high-elevation freshwater ecosystems (e.g., lakes, and watersheds with glaciers), their biodiversity and ecosystem services in the tropical Andes. We therefore combined a literature review and map analysis of PAs of International Union for Conservation of Nature (IUCN) and national systems of PAs, and freshwater ecosystems. We found that seven national parks were created for water resources protection, but were not designed for freshwater conservation (i.e., larger watersheds). High-value biodiversity sites have not been protected, and new local PAs were created due to water resource needs. We quantified 31 Ramsar sites, and observed that PAs cover 12% of lakes, 31% of glacial lakes, and 12% of the total stream length in the tropical Andes. Additionally, 120 watersheds (average area 631 km2) with glaciers and 40% of the total glacier surface area were covered by PAs. Future research about the role of PAs in ecosystem services provision, and more detailed freshwater inventories within and around PAs, especially for those dependent on glacier-runoff, will fill key knowledge gaps for freshwater conservation and climate change adaptation in the tropical Andes.