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Intensive Primary Forest Loss on the Island of Hispaniola from 1996 to 2022

Hong, Falu  ; Hedges, S. Blair ; Yang, Zhiqiang ; Zhu, Zhe

Primary forest (PF) is critical in supporting biodiversity and mitigating greenhouse gas emissions. However, the continuous monitoring of PF loss through remote sensing time-series observations remains largely unexplored, particularly in undeveloped and developing countries. In this study, we use the COntinuous monitoring of Land Disturbance (COLD) algorithm and Landsat time-series data to quantify PF loss on the island of Hispaniola, including Haiti and the Dominican Republic, from 1996 to 2022. The major findings include: (1) Haiti experienced a more pronounced PF loss compared to the Dominican Republic despite its lower PF coverage. From 1996 to 2022, PF in Haiti decreased from 0.64% to 0.35%, while PF in Dominican Republic decreased from 7.17% to 4.89%. (2) PF loss is observed both inside and outside protected areas. In Haiti, more PF loss occurs within protected areas than outside those areas. In the Dominican Republic, PF loss rates inside and outside protected areas are comparable. (3) The mean topographic slope of PF shows an increasing trend through time in both Haiti and Dominican Republic, suggesting slope plays a key role in PF loss. Despite the disparities between Haiti and Dominican Republic in preserving PF, urgent conservation policies are needed for the whole island. The land cover maps framework can be extended beyond the island of Hispaniola to larger regions for evaluating the impacts of PF loss on biodiversity conservation and ecosystem services.

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