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Assessing vegetation dynamics in global high-mountain ecotones

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As the climate warms, vegetation within treeline ecotones is responding. The high-mountain ecotones, which are less affected by anthropogenic disturbances, present an optimal environment for investigating the effects of climate change on terrestrial ecosystems. Accurately delineating the trends of vegetation in high-mountain ecotones is pivotal for a comprehensive understanding how climate change affects these ecosystems. Remote sensing technology has a significant potential in detecting and quantifying vegetation variation. While previous studies have identified greening trends within certain mountainous regions, there remain a gap in global-scale analysis concerning vegetation dynamics in high-mountain ecotones.

In this study, we utilize long time-series Landsat imagery to monitor and analyze vegetation dynamics in high-mountain ecotones. Our approach includes assessing changes in the physiological properties of the vegetation and analyzing temporal patterns in spatial distribution changes. The results reveal a consistent trend of increased vegetation density and enhanced greening of vegetation in global high-mountain ecotones under the influence of climate change.