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Linking satellite-derived greening trends and field observations in the high-alpine

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An increase in vegetation productivity has been attributed to accelerated warming in different mountain ranges over the last decades by analysis of satellite imagery. Here, we quantify such a greening trend on 767 sampling plots with a high topographic variety in elevation, slope, and aspect in the sub-alpine to nival vegetation belt of Mt. Schrankogel (Tyrol, Austria) over the past four decades by analysing Landsat satellite image time series. We found (i) a good agreement of NDVI with *in-situ* vegetation cover estimates in a reference year and (ii) a widespread greening trend. Our set of plots has experienced a median greening trend of 0.018 NDVI units per decade, with 98% of the plots showing a positive NDVI trend. These results need to be considered with caution as the detailed analysis of the NDVI time series together with knowledge of the local conditions at the plots reveals potential pitfalls for interpretation. These are related to geomorphological disturbance of soil and vegetation, legacy effects of 20th century glacier retreat, or data scarcity (due to snow and clouds). Nevertheless, our study generally supports the notion that the productivity of cold-limited vegetation has increased which is even detectable from space.