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Assessment of grassland degradation in alpine meadow using visible vegetation indices by UAV on Qinghai-Tibetan Plateau

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Grassland degradation is a global ecological problem, and grassland on the Qinghai-Tibetan Plateau (QTP) is suffering serious and continuous degradation. Due to the vulnerability of grassland ecosystem on the QTP and its sensitivity to global climate change, alpine grassland degradation needs more attention. In this study, we extracted 7 visible vegetation indices by using an unmanned aerial vehicle (UAV) with visible light sensors. We used random forest model and stepwise multiple regression establishing the relationship between visible vegetation indices and field degradation index to assess alpine meadow degradation. The result showed that ExG (Excess Green Index) was effective in the simulation with an R^2 value of 0.53. The degradation distributions of 50 field sites were obtained at 10cm spatial resolution. This study with visible vegetation indices by UAV provides an effective approach for monitoring grassland degradation at low altitude. The high resolution contributes to more refined grassland management.