

The utility of MODIS Land data products for predicting species occurrences in the Andes of Peru and Bolivia. Hernandez, Pilar, Victor Pacheco, Lily Paniagua, Heidi Quintana, Jennifer Swenson and Bruce Young.

Abstract:

Species distribution modeling can provide an estimate of the potential for a species to occupy areas not already surveyed and consequently is becoming a valuable tool for conservation planning. Models are generated by extracting information about the environmental characteristics at sites of known occurrence, deriving a species-environment relationship and applying this relationship to the entire region of study to obtain continuous predictions of occurrence. For environmental variables to be considered as model predictors, they must be mapped over the entire study area. As a result, variables are often selected based on their availability and not just biological reasoning. This is usually the case for data poor regions where the only readily available predictor variables are those derived from DEM and climate data. While these variables are extremely useful, they do not provide descriptions of other important drivers of species distribution patterns such as vegetation and land cover. Moderate Resolution Imaging Spectroradiometer (MODIS) products have the potential to fill in these data gaps given their spatial coverage, resolution and free online access. However, research is needed to determine whether MODIS data can indeed increase model predictive accuracy. We investigated the utility of MODIS Land data products as predictors of mammal species' distributions using locality data for 48 species endemic to our study area in Peru and Bolivia. Models generated with climate and DEM predictors were compared to models that also included predictors derived from MODIS products. Resulting predictive distribution maps were evaluated using the AUC evaluation statistic and by expert review.