

Mapping and estimation of forest attributes using GNN imputation of survey data with vegetation phenology

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Abstract: The Gradient Nearest Neighbor (GNN) imputation technique was applied to USDA Forest Service Forest Inventory and Analysis survey data collected in the state of Michigan. Canonical Correspondence Analysis models were constructed that relate plot measures of basal area per acre by tree species to several mapped environmental variables, including seasonal changes in the Enhanced Vegetation Index collected by the satellite-borne Moderate Resolution Imaging Spectrometer. The resultant maps were used to produce post-stratified estimates of assorted forest attributes, for all tree species and by species group, across a range of spatial scales. The results suggest that unbiased estimates of most forest attributes can be produced from these maps with comparable or better precision than the current methodology employed for the North Central region.