Landscape indicators for detection of temporal change in fragmentation

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Abstract

Patch-based landscape metrics dominate the conceptualization and practice of landscape ecology, but they have not been evaluated for detection of temporal change. Our evaluation, complemented by existing literature, indicates that patch-based landscape metrics have four shortcomings when used for detection of temporal change. When used for temporal change detection, patch-based metrics: 1) can be difficult to interpret; 2) can produce counterintuitive results; 3) fix the observation scale by focusing on patches, and; 4) are not relevant when the feature of interest is dominant (i.e, the matrix rather than the patch). Following our review, we re-introduce a fundamental and straightforward landscape metric, amount (proportion), and show how it can be used to unambiguously measure fragmentation change. We focus our temporal analyses on US forests to show how changes in amount can be used to measure changes in forest interior, changes in forest edge, and changes in the scale at which forest occurs in and dominates the US landscape.