

Landscape disturbance mapping by the LANDFIRE program

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LANDFIRE is a multi-agency vegetation, fuels, and fire regimes mapping program that provides consistent and comprehensive geospatial data layers for the entire US. To maintain currency of LANDFIRE data, landscape disturbances are mapped regularly and used to update LANDFIRE layers. LANDFIRE disturbance mapping is unique because it maps all lands in the entire country annually at 30m resolution with the resultant data freely distributed.

The LANDFIRE disturbance mapping process incorporates geospatial events data depicting land management activities and landscape disturbances from national databases and contributed by local users. These data are used with the Remote Sensing of Landscape Change (RSLC) process to detect change on the landscape. The current LANDFIRE RSLC process uses the Multi-Index Integrated Change Analysis (MIICA) algorithm which detects landscape change using two dates of Landsat imagery per year by tracking several spectral indices through time. A tiling and compositing procedure was developed to create inputs for MIICA. A tile set was developed for the conterminous US containing 98 tiles nominally 10,000 x 10,000 pixels each. Composite images were developed for each tile by combining images from all path/rows that intersect a given tile within a specified time frame from a target date. Images were converted to surface reflectance, re-projected, framed to the tile extent, and then masked to remove clouds, shadows, water, and snow. Where multiple valid observations remained for a pixel, a selection function was used that considered the proximity of each observation to the target date and the degree of similarity between all valid observations.

Annual disturbance layers are available for the years 1999 – 2010, and products for 2011-2012 are expected in late 2014. They include attributes indicating the year, type, severity, and source of disturbance. The result is a comprehensive suite of data for all lands describing over a decade of landscape change.

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