

SCIENCE FOR DECISION MAKING

The **Western Fire & Forest Resilience Collaborative (WFFRC)** is a multi-institution collaborative of researchers advancing breakthrough science on fire and ecosystem resilience across the western U.S. Our Collaborative strives to make our science actionable by engaging land managers, supporting research applications, and delivering practical, ready-to-use products that can address management challenges. WFFRC's Ecological Burn Severity Atlas is one example of these products.

ECOLOGICAL BURN SEVERITY ATLAS

The Ecological Burn Severity Atlas¹ is a set of maps of the ecological effects of wildfires in western U.S. forests between 1987 and 2024. The Atlas translates satellite-detected changes in vegetation reflectance into interpretable metrics of burn severity that are calibrated to local forest structure and other ecological conditions. The Atlas extends commonly used burn severity products, such as BARC and MTBS categorical severity maps, by mapping multiple on-the-ground ecological effects of wildfire. For all fires larger than 247 acres, the Atlas includes one-year post-fire layers for basal area mortality, stem mortality, live canopy cover loss, tree needle/leaf retention, tree bole char, and ground surface char. For each of these metrics, the Atlas includes a best estimate, the upper-bound and the lower-bound, explicitly quantifying the uncertainty in burn severity modeled with remotely-sensed data. The Atlas uses a specific forest mask, which is also included with the data layers, along with the RdNBR satellite index used to model the burn severity metrics.

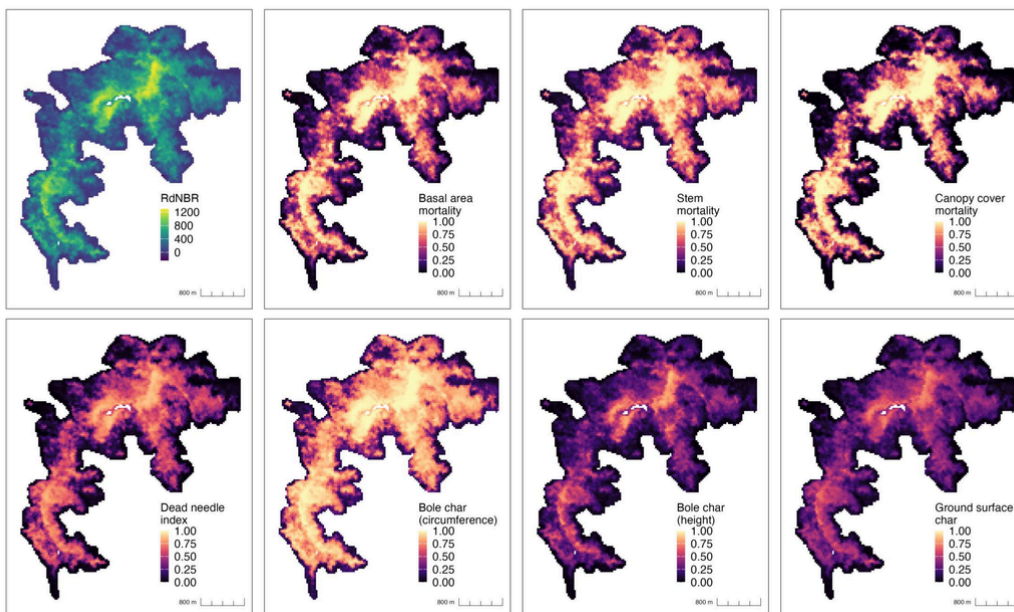
The Ecological Burn Severity Atlas adds to the datasets that are currently available for quantifying burn severity (Composite Burn Index, pre-fire and post-fire satellite imagery, fire perimeters, dNBR/RdNBR, and MTBS severity class).

Spatial data layers included in the Ecological Burn Severity Atlas: forest mask, RdNBR satellite index, and seven continuous, quantitative metrics of fire-caused ecological change with uncertainty in these estimates.

The Atlas will be updated annually with current post-fire satellite imagery.

POTENTIAL APPLICATIONS

- **Examine the ecological effects of a forest fire, including the potential range of on-the-ground effects when qualified from remotely-sensed observations.**
- **Inform management decisions with a more complete assessment of the post-fire effects on vegetation than is provided by existing burn severity layers.**



The Ecological Burn Severity Atlas shown for an example wildfire one year post-fire. Along with the satellite index of RdNBR, the Atlas provides data on the proportion of the burned area resulting in basal area mortality, stem mortality, canopy cover mortality, dead needle index, bole char, and ground surface char.

¹ Buonanuci, M.S., K.H. Brazunas, M.M. Laughlin, G.W. Meigs, A.L. Reiner, S.J. Saberi, and B.J. Harvey. Ecological burn severity atlas for forests of the western United States. Submitted to Ecological Applications