

MODELING POST-FIRE WOODY CARBON DYNAMICS WITH DATA FROM REMEASURED INVENTORY PLOTS

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Abstract—In California, the Forest Inventory and Analysis (FIA) plots within large fires were visited one year after the fire occurred resulting in a time series of measurements before and after fire. During this additional plot visit, the standard inventory measurements were augmented for these burned plots to assess fire effects. One example of the additional measurements is the post fire index (PFI), which is a fire severity classification based on post-fire crown observations. Stands that showed presence or no evidence of residual green crowns were assigned to PFI classes Alive and Dead respectively. The repeated measurements of 109 burned FIA plots allowed us to quantify gains and losses in dead and live woody carbon pools in the first five years following a wildfire. We used a mixed model to estimate the change in each woody carbon pool as a function of PFI, years since fire, and pre-fire woody carbon. Most of the 109 plots in this study burned with low to moderate severity and the post-fire carbon trajectories by pool differed from those observed for the stands that burned with high severity. This study showcases how large-scale inventory data can be supplemented with additional re-measurements to answer disturbance related research questions and hypotheses.

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