

The 2024 Mill Fire: Insights from Field Observations and WRF-SFIRE Simulations

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The 2024 Mill Fire within the Gold Complex near Portola, California, was a small lightning-ignited fire (~12 km²) that generated unusually intense fire-induced convection while exhibiting an abrupt halt in fire spread without major suppression efforts. Using post-fire field observations and WRF-FIRE simulations, we investigated how fine-scale heterogeneity in fuel loading and fuel moisture influenced fire behavior and spread. Field surveys revealed recent fuel reduction along an unpaved road and elevated moisture associated with a shallow trench, both of which contributed to limiting fire propagation. Numerical experiments demonstrate that maintaining up-to-date representations of fuel treatments and spatially heterogeneous fuel moisture is critical for accurately simulating fire spread and fire-atmosphere interactions.