

## **The Effect of Fire Temperature on Soil and Organic Matter Properties**

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Fire has diverse and significant effects on physical and chemical properties of soil and soil organic matter (SOM). In this study we are investigating the effect of combustion temperatures on the physical and chemical properties of five soils from an elevational transect along the Western slope of the Sierra Nevada Mountains in California. The elevation transects spans from 198 to 2865 m and all the soils were formed from granitic parent material, but show significant differences in SOM content and soil mineralogy owing to the effects of climate on soil development. Soils from 0 to 5 cm depth were combusted at five different temperatures that correspond to major fire intensity classes (150, 250, 450, 550 and 650 °C). We determined the effects of combustion temperature on aggregation, specific surface area, pH, carbon and nitrogen content, composition, and distribution inside aggregates, mineralogy, and cation exchange capacity. Among other things, we found significant reduction total C and N, accumulation of aromatic carbon functional groups, and loss of aggregate protection of C as the combustion temperature increases. Findings from this study are critical for determining the rate of change in carbon and nitrogen loss, and other essential soil properties for topsoil's exposed to different intensity fires.