



**CALIFORNIA SCIENCE & ENGINEERING FAIR  
2018 PROJECT SUMMARY**

<b>Name(s)</b> Firas A. Qureshi	<b>Project Number</b> <b>J1214</b>
<b>Project Title</b> <b>A Geotechnical Investigation of Infused Soil Characteristics</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The 2017 California Wildfire Season was the most destructive on record. Over 9,054 fires burned 1,381,405 acres. I wanted to learn if wildfires affect soil fertility by studying the soil's characteristics such as the Potassium, Phosphorus, Nitrogen, and pH Levels of the soil as well as the vertical stem growth of the radish plant planted in the soil. My hypothesis stated if soil was affected by wildfire, then that soil would be more fertile compared to soil not affected by wildfire. Based on the nitrogen cycle, wildfire burn leads to increased release of nitrogen levels in the soil, augmenting the soil's fertility. <b>Methods/Materials</b> In my investigation, I planted four radish seeds in eight trials of wildfire soil and eight trials of topsoil in a natural environment. I planted radish seeds because of the short germination period. I watered each pot of seeds with 30 mL of water every three days starting on the day of planting and did this for three weeks. At the end of each week, I measured and recorded the plant's vertical stem growth. I also tested and recorded the Nitrogen, Phosphorus, Potassium, and pH Levels of both the topsoil and wildfire-affected soil. <b>Results</b> The pH levels in wildfire soil were closer to neutral compared to topsoil across the trials. The nitrogen levels in the topsoil were on average deficient compared to the wildfire soil which was sufficient or in surplus. The radish seeds in the wildfire-affected soil erupted within the first week and grew to be on average 3.5 times higher in vertical stem growth. The potassium and phosphorus levels in the wildfire-affected soil were sufficient compared to the levels of topsoil across three weeks. <b>Conclusions/Discussion</b> Overall, the data supported my hypothesis. The radish seeds in the wildfire-affected soil germinated quicker and grew much more than the plants in the topsoil. This could be due to the fact that there weren't enough nutrients in the topsoil for the radish plants to grow naturally. There was a direct correlation between the Nitrogen, Phosphorus, Potassium, and pH Levels in both the topsoil and wildfire-affected soil. The study supports that new life can be supported by wildfire effectively.	
<b>Summary Statement</b> By comparing radish seed germination, growth, and chemical characteristics between wildfire-affected soil and topsoil, I studied how soil fertility affects the post-wildfire environment.	
<b>Help Received</b> I would like to acknowledge my mother for helping me buy my materials	