



**CALIFORNIA STATE SCIENCE FAIR  
2003 PROJECT SUMMARY**

<b>Name(s)</b> <b>Gina G. Catalano</b>	<b>Project Number</b> <b>S0801</b>
<b>Project Title</b> <b>The Effect of Earthworms on Fire-induced Hydrophobic Soils</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The purpose of my project was to see if earthworms would cut through the ash and hydrophobic layer of soil after a fire. If the earthworms succeeded, this would be an additional way to rehabilitate fire-induced hydrophobic soil, specifically relating to erosion control.</p> <p><b>Methods/Materials</b> The entire experiment was performed inside a redwood planter filled with dirt. To stage the controlled burn, leaves, pine needles and other organic matter were added to the planter and set on fire, burning for 30 minutes to achieve hydrophobic soil. Hydrophobicity tests were conducted 24 hours after the burn. This composed of dropping water on different levels of the topsoil, and timing and recording the absorption rate. Once the soil was positively identified as being hydrophobic, small worms were added to the planter. After a few days, the worms' progress was evaluated and deemed unsuccessful. Bigger worms were brought in, and once again, after a few days, the second batch of worms was evaluated for soil penetration. In the end, the soil was sifted and worms were tallied.</p> <p><b>Results</b> There was no recorded penetration of either the ash or hydrophobic soil layers with the first group of worms. In the second group, of the initial 20 jumbo reds and 12 nite crawlers, 8 jumbo reds and 9 nite crawlers were successful in the penetration of both the ash and hydrophobic layers. The worms had spread themselves throughout the box, burrowing on all four sides plus the middle. After the burn, the hydrophobicity of the soil was tested in five different locations on both the experimental and control sides and was recorded to be 35 seconds. After seven days of earthworm activity, the tests were done in the same locations. The timings on the experimental side ranged from 6 to 9 seconds, while the control side rose to 39 seconds.</p> <p><b>Conclusions/Discussion</b> I conclude that certain earthworms have a beneficial effect on rehabilitating soil affected by fire, specifically in high burn intensity areas when hydrophobic soil and thick ash layers are present. Because of this ability to help restore fire-damaged soils, I envision the introduction of earthworms with mulch as a restoration method in post-fire erosion control in areas where only mulch is currently being used.</p>	
<b>Summary Statement</b> What effect does adding earthworms to soil affected by fires have on the hydrophobicity rate of the soil?	
<b>Help Received</b> Father helped build planter, Parental Supervision of controlled burn.	