



**CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY**

Name(s) Ava Cannizzaro	Project Number J1108
Project Title Adding Structure to Water: A Novel Approach for Treating Wildfires	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of this study is to understand which super absorbent polymer worked best in adding structure to water. The idea is that a wall of water would be a better application in treating the progression of wildfires.</p> <p>Methods/Materials Five different variables were tested. The first three were different volumes of super absorbent polymer (SAP): regular (low volume SAP), fake snow (medium volume SAP) and Orbeez (high volume SAP). The last two variables were water and the removal of fuel.</p> <p>The model was designed with a strip or lane of fuel (wood flakes). Two matches at the end of the strip acted as indicators for fire progression. The polymers were saturated with water and applied to the test zone in the model.</p> <p>Results After running seven trials, the Orbeez proved to work the best. They used the least amount of water and had the highest volume which led to the #water barrier# having the best structure preventing the fire from progressing. Following the Orbeez was the fake snow with the second highest volume, then the regular super absorbent polymer, then removal of fuel and in last was the water. Water alone did not control the fire.</p> <p>Conclusions/Discussion The results show that my hypothesis should be correct in that water with structure would be better than water alone in controlling wildfires. The specific approach applied here was to add structure to water to diminish both heat and oxygen from the fire triangle. The water alone did not control the fire. The water had no structure and essentially sank to the bottom of the model. This would be equivalent in a wild fire to simply pouring water on the ground and watching it absorb in the soil. The more volume and more structure of the water, the more it prevented the fire from progressing.</p>	
Summary Statement I measured the ability to stop the progression of a wildfire (based on a model) with the application of hydrated superabsorbent polymers.	
Help Received I discussed the model with my advisor and he helped me build the model and ensure safety of running a fire model. I also discussed my approach with Captain Carlos Nieves of the Boston Fire Department.	