



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Caroline Frost	Project Number J0705
Project Title Fighting Wildfires: It's an Uphill Battle	
Objectives/Goals Wildfires are very devastating in California. Every year, they kill people, burn down and damage thousands of homes and force many people to evacuate their homes and neighborhoods. They cause millions of dollars in damages. Yet, many times, wildfire is a naturally occurring phenomenon. The forests must occasionally be cleared of accumulated vegetation and wildfires assist in this clearing by destroying parts of the wild woodland. With a wildfire, you have to remember that if you suppress it now, the unburned brush will accumulate and today's small wildfire can become next year's massive wildfire. The purpose of this experiment is to study wildfire flame propagation to determine whether uphill or downhill winds cause the greatest speed in flame propagation. The hypothesis is that wildfire always burns faster going uphill than downhill. This is because the wildfire is closer to the fuel going uphill.	
Abstract Wildfires are very devastating in California. Every year, they kill people, burn down and damage thousands of homes and force many people to evacuate their homes and neighborhoods. They cause millions of dollars in damages. Yet, many times, wildfire is a naturally occurring phenomenon. The forests must occasionally be cleared of accumulated vegetation and wildfires assist in this clearing by destroying parts of the wild woodland. With a wildfire, you have to remember that if you suppress it now, the unburned brush will accumulate and today's small wildfire can become next year's massive wildfire. The purpose of this experiment is to study wildfire flame propagation to determine whether uphill or downhill winds cause the greatest speed in flame propagation. The hypothesis is that wildfire always burns faster going uphill than downhill. This is because the wildfire is closer to the fuel going uphill.	
Methods/Materials First build a #hill# with a wooden board and nails jutting out at regular intervals. Put #trees#, or rolled up pieces of newspaper, onto the nails. Set the #hill# at a forty-five degree angle. Set up the fan so it either blows uphill or downhill. Light five strips of newspaper at the top of the hill to start the fire, and time the fire's starting point to the ending point, which will either be the bottom to top or top to bottom. Record the times.	
Results The downhill burned in 140.1 seconds on average. The uphill burned in 14.9 seconds on average.	
Conclusions/Discussion My hypothesis was correct: the flame propagation with wind up the slope is faster than it with wind down the slope. With the wind up the slope, the propagation was ten times faster than with wind down the slope. With the wind up the slope, the propagation was 2 inches per second. With the wind down the slope, the propagation was .2 inches per second. Uphill fires burn much faster than downhill fires.	
Summary Statement My project is a study of wilfire flame propagation.	
Help Received Father supervised project	