

**Los Alamos Middle School Team 1**  
**Earth Science**  
**Calculating the Creation and Spread of Forest Fires**

**Our Problem:** We are trying to accurately simulate the creation and spread of forest fires under different conditions. It is important because it can help fire fighters plan where wildfires will appear and how they will spread, in order to put them out quicker, and identify them before they start. It could also be used to predict how controlled burns will affect the likelihood of uncontrolled wildfires, and how they will affect the ecosystem.

**Our Plan to Solve It:** We will start with a simple program that calculates the creation and spread of wildfires during both droughts and in climates with more precipitation. As time progresses, we will take into consideration more variables, such as different kinds of trees with different combustion temperatures. Our goal is to create a program that can accurately predict the creation and spread of wildfires using the variables input by the user, such as the amount of yearly precipitation, the types of trees, and the terrain.

**Our Progress So Far:** We have a program that models a grid with cells. A random cell is turned orange using a uniform random distribution (this symbolizes it being lit on fire). It then spreads to the neighboring cells. After a certain amount of time, all the squares turn black, meaning they have burned out. In addition, we have done research into how fires start and spread.

We have learned:

- 90% of all wildfires are caused by humans
- “Crown fires” spread by fast wind going over the tops of trees
- “Running crown fires” are even more dangerous. They burn extremely hot, travel fast, and change direction quickly
- Large wildfires called conflagrations can produce their own weather
- Most animals are able to escape the flames
- Fire tornadoes are when fire spirals up and into the air
- Climate change may cause more fires

**The Results We Expect:** We expect a program that can model the creation and spread of forest fires, using variables input by the user, such as the humidity, temperature, wind speed and direction, elevation, etc.

**Our Citations:**

Gurstelle, Williams. *The Practical Pyromaniac*. Chicago: Chicago Review Press Inc. 2011.

“11 Facts About Wildfires”. DoSomething.org. Do Something. 9 December 2016.  
<https://www.dosomething.org/facts/11-facts-about-wildfires>

“Forest Fire Facts”. *Kidskonnnect.com*. Kidskonnnect. 9 December 2016  
<https://kidskonnnect.com/science/forest-fire/>

“Five Surprising Facts About Wildfires”. *AccuWeather.com*. AccuWeather, Inc. 9 December 2016  
<http://www.accuweather.com/en/weather-news/five-surprising-facts-about-wi/17834750>

“Wildfires Fast Facts”. CNN.com. Cable News Network Inc. 9 December 2016  
<http://www.cnn.com/2013/06/21/us/wildfires-fast-facts/>