Fire Susceptibility in Oregon
A Fire Risk comparison of Crater Lake National Park and the Umpqua National Forest

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Abstract

Wildfires in our National Parks, forests and other forests across America are a frequent and important occurrence. They encourage new growth in the forests creating more diverse and healthy ecosystems, but also destroy millions of dollars of timber industry and residential structures every year. The state of Oregon has numerous forest fires every year varying in size and destruction. Many of these fires take place in Crater Lake National Park and nearby National Forests. (Figure 1) This project compares these two areas and considers the question of whether or not forest management has any effect on the frequency of fires in them. A fire susceptibility model is developed to better predict where fires are more likely to occur. The model incorporates factors like vegetation type, weather patterns, hill slope, and elevation and forest desolation. This information can assist in the prevention of fires, as well as in deciding whether or not logging and other forest management techniques should be used to decrease the likelihood of fires in this park and forest.

Introduction

Recently I was in Oregon as part of a field seminar class for the Geography department at the University of Wisconsin, Eau Claire. We explored cultural, human and physical geography throughout the state. We visited various national parks and forests looking at the physical features as well as some of the history of the areas. Throughout the trip I noticed an element that has affected most all of the physical features in Oregon. That element is fire. There are a couple of different sources for this fire that has shaped the land. There is the past and limited present volcanic activity that created fires through the mountain range, as well as the many past and very present forest fires. These forest fires vary in size and severity as well as how they are started. Many of the fires are started by humans accidentally but lightning strikes are also a large contributor. I have an interest in forest fires and fire management and I felt that this would be a good topic that could lead to a very interesting research project. There are two questions that were explored during this project.

Research Questions

What effect if any does forest management have on the frequency of fires in the Umpqua National Forest and forests in general?

This question required much more book reading and source skimming for an answer than the second question in this project. In order to explore this question I began to look around the internet to see what I could find about how logging and forest management can affect forests. I also used some books and movies in my exploration. Studies that have been done in the past also provided me with valuable information on the topic.

How do the fire susceptibility models for the two parks compare as far as risk of fire?

Finding a way to compare the fire susceptibility of each of my study areas which are the Umpqua National Forest and Crater Lake National Park in Oregon. The program I used to generate these models is called ArcMap which is a geographic data analysis program.

Results

The results from my comparison unfortunately do not include any data on where logging and forest management is taking place in the Umpqua National forest however based on my research on the effects of logging I feel that my fuel values and overall risk of fire in the park would be decreased. The comparison of each factor in the two parks and the final result are very interesting and in some cases surprising. To get a sense of the differences a map was created of each factor comparing the two study areas. To help better understand and visualize the factors being described below each of the factors with a description and map are included.

Conclusion

As was explained earlier, all of the factors in figures 4-10 were added together to get what you see in figure 11 which is a fire susceptibility model of each of the parks. Based on my susceptibility model Crater Lake National Park has a much higher risk of forest fires occurring. This determination is made by looking at the amount of red color or high fire risk areas on the map compared to the Umpqua forest. Some factors that are likely contributors to this higher risk are the greater elevations, greater overall slope which can lead to more chance of crown fire, and now the increased presence of tree killing insects and diseases. The greater area of south facing slopes and overall dryer conditions in the park may be factors as well. Logging and forest management that is taking place in the Umpqua National forest may be a factor that is keeping the risk there much lower. That can not be said for sure however, because logging data from the forest was not available for this study.

In conclusion, I hope this project will add to the knowledge and understanding, by use of geographical data related to the element of fire, of how humans can positively impact the desolation of fire and best manage it. By looking at a wide variety of factors that contribute to the fires in a geographically spatial context, this study has shown information that can be useful to private land owners who want to protect their land from fires as well as state level and higher government agencies that protect and monitor our National Parks and Forests around the United States.

References


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