Introduction

The Colockum Tarps Fire occurred in southeast Chelan County and eastern Kittitas County. There are two main types of vegetation within our study area: forest vegetation and grasses. The Colockum Tarps Wildfire area is also used for recreational activities such as hiking, horseback riding and hunting. Current land ownership of the area is Bureau of Land Management, Washington Department of Fish and Wildlife Department of Natural Resources, and private land owners.

Methods

Our methodology includes:

- Analyzing how human and environmental factors played a role in the spread of the fire
- Fieldwork
- Remote sensing analyses such as Normalized Burn Ratio (NBR), Change Detection, and Normalized Difference Vegetation Index (NDVI)

To analyze the impacts of human and physical factors we utilized ArcGIS and air photo interpretation to spatially analyze and interpret the effects. Air photos, shapefiles and graphs were used to determine the results and came from several sources:

- Kittitas County Climate Data
- Washington Department of Ecology
- Washington Department of Natural Resources
- U.S. Geologic Survey
- U.S. Department of Agriculture

The human factors included:

- Land Use Land Cover (LULC) infrastructure
- Agricultural practices
- Recreational activities

The physical factors included:

- Topography
- Climate
- Soils

The fieldwork for this project included GPS points as well as photos taken in October 2014. Another goal was to use fieldwork to determine after effects of the fire, fire severity, and to confirm that our remote sensing analyses correctly interpreted what was on the ground.

Results

- Figures 5, 6 and 7 show how the fire burned through the area and level of severity. These maps show a NBR from three separate dates, all comparing the pre-fire (06/13) landscape to the post-fire landscape (08/13, 10/13 and 09/14). The dark green shows areas of high post-fire regeneration, whereas red shows areas of moderate-high severity burns.

- Figures 8, 9, 10 and 11 are a NDVI analysis. The more white the image it shows a greater concentration of actively photosynthesizing or green vegetation that is in that specific area on the ground. The darker areas show where there is little vegetation or barren land. The two images on the left are from August 2013 while the two on the right are from September 2014.

- Figure 12 shows Change Detection. This shows how the landscape has changed from August 2013 to October 2013. Blue shows the least amount of change while pink shows the most change.

Conclusion

The fieldwork displayed the fire pattern that was represented in the air photo and remote sensing analysis. The fire moved from the North Eastern regions of the wildlife area and moved in a South West direction. The fire moved across grasslands and burned down and up multiple ridge lines through forested vegetation. The NBR displayed the severity of the fire along ridge lines and across the open area of the wildlife area which reflected in our fieldwork. The NBR also displays vegetation regrowth after two months in October 2013 and after a year in September 2014. This showed that areas where grasslands have recovered well post fire but the areas that were forested have not recovered a year after the fire occurred. The results of the NDVI and the Change Detection Analysis showed significant change in the vegetation before and after the fire. However, the Change Detection image showed some inaccuracies. Some areas were displayed as high areas of change, however, these were incorrectly display due to shadows within the October 2014 image. Overall, we found that our fieldwork accurately supported the results of the dNBR, NDVI and CD analysis. The GPS points that were taken for fieldwork correctly matched our analysis of the spread of the fire.

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References