The Differences in Vegetation Type on North and South-Facing Slopes

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Recommended Citation

Villablanca, Andrew; McCabe, Katherine; and Galuhn, Daniel, "The Differences in Vegetation Type on North and South-Facing Slopes" (2012). Pepperdine University, All Undergraduate Student Research. Paper 43.  
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Abstract:
Our project investigated the relationship between climate change and vegetation type conversion in the Santa Monica Mountains on north and south facing slopes. Our hypothesis is that with a shift in climate towards dryer, hotter, and longer summers, and shorter and dryer winters, we will see a shift in the density of native chaparral in the Santa Monica mountains, and possibly an influx of non-native species. We tested this hypothesis by choosing three study sites that were on north/south ridgelines to simulate a dryer, harsher climate (south) and a more temperate climate (north). Using the point-quarter method to measure the prevalence of each type of plant in each study area we were able to determine what was growing on each slope. Our investigation is significant and relevant because if our hypothesis is correct, and there is a shift towards coastal sage and non-natives in areas that normally had chaparral, there would be serious consequences for the ecosystem and humans. An increase in smaller plants would decrease fire interval, which is dangerous to humans and is devastating to the plant infrastructure as it creates a positive feedback loop that promotes the influx of dry flash fuel invasive and exacerbates the decrease of the fire return interval.

Materials and Methods:
For our study sites, we chose three north and south slopes in the Malibu area of the Santa Monica Mountains. These sites were carefully selected so they could best represent the effects of climate change. As for our method, we used the point-quarter method at each of our three locations to measure the plant-to-plant distance, the diameter at the ground of each plant, the height of each plant, as well as what type of plant was recorded (Native Chaparral (NC), Invasive (I), or Coastal Sage (CS)). This process was repeated four times on each side of the slope at the three sites in order to establish a means of comparison.

Discussion:
It appears that Native Chaparral (NC) was more dominant on north facing slopes primarily because of sun exposure and amount of moisture. Adversely, Coastal Sage (CS) vegetation type conversion is occurring on south facing slopes, as there are almost no live chaparral species. These results reflect that while our hypothesis was wrong, our reasoning and consideration of all environmental factors were correct.

Conclusion:
Our results showed that chaparral was more prevalent, as well as more healthy on North facing slopes. On south slopes, there is an apparent vegetation type conversion to costal sage, which allows for the infiltration of invasive species.

Acknowledgements:
We’d like to thank Dr. Stephen Davis, Nicholas Huron, and Taylor Stucky for their contributions in our investigation.

Literature Cited:


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