ABSTRACT

TITLE:	The Effects of Mountain Pine Beetles on Lodgepole Pine Stands in Colorado
AUTHOR(S):	Casasanto-Zimmermann, Kale
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ABSTRACT: Lodgepole pine stands (pinus contorta) throughout Colorado have recently experienced an increase in mountain pine beetle (MPB) attacks, which has led to heightened tree mortality in affected regions that are directly tied to these attacks. Decreased frequency of cold days and warmer winter temperatures is what has allowed for MPB's to overtake entire pine forests. The mountain pine beetle has instigated billions of tree deaths from Mexico to Alaska since 2000 and it continues to harm pine stands to this day. Although there are still many unknown aspects of the mountain pine beetles' (dendroctonus ponderosae) existence it has been proven that the increased reproduction rate that is occurring in mountain pine beetles can be broadly attributed to climate change. It is known that there are three main factors that contribute to the success of mountain pine beetles: density of large trees, drought, and warmer temperatures, which are all factors presented by the effects of climate change. According to a study done on the effects of the mountain pine beetle, these infestations have changed surface fuel and wildfire hazards, vegetative compositions, converted live carbon sinks to dead and slowly decaying carbon sources, impacted nutrient cycling and water quality, shifted evapotranspiration and albedo, modified local surface energy balance, and changed regional climate. Many researchers have been exploring ways to successfully enact strategies that mitigate, suppress, and regenerate lodgepole pine forests that have been overcome by mountain pine beetles. This research aims to discover the effects the mountain pine beetle has on lodgepole pine species in Colorado and how those issues relate to changes in climate and ecosystem services of the affected areas.