

# Changes Observed in the Urban Heat Island Phenomenon Due To An Increase In The Tree Canopy

The research's main focus is to observe the changes in the Urban Heat Islands when the tree canopy area is increased in two study areas, residential and industrial, in the Jasper Place district of Edmonton. These study areas are the two hotspots of approximately 0.5 KM<sup>2</sup>. The City of Edmonton is currently working on the Tree Canopy Expansion project. The research selects a hotspot from a district based on the Urban Heat Island and tree canopy area. The research forms a base on this project and forecasts the decrease in Land Surface Temperature observed on a micro-scale. 10.69% of the current 1.299% of tree canopy was increased in the residential hotspot and 10.5% of the current 0.41% of tree canopy was increased in the industrial hotspot. The changes in the Land Surface Temperature after increasing the tree canopy area were observed using ENVI-met, a microclimate simulation model. It showed a maximum decrease of 0.56 degrees Celsius for residential hotspot and 0.15 degrees Celsius for industrial hotspot. The presence of lower albedo materials used in the built form of the industrial area shows a lesser decrease in the temperature. This suggests an intensive increase of tree canopy in industrial areas is required. It was also observed that the significant effect of the tree canopy can be observed better during daytime than nighttime. The research suggests that proper planning of the increase in tree canopy area can substantially reduce the Land Surface Temperature which further reduces the Urban Heat Islands. The research recommends a stronger policy for increasing the tree canopy across the city on both, public and private parcels.