ABSTRACT

UAVs are becoming more common in our modern world. UAVs are mostly associated with war due to the coverage of their use in the recent wars in Iraq and Afghanistan, but have the ability to do much more. UAVs are helpful tools in assessing damage after a disaster, keeping rescuers safe while they help those in need. UAVs are useful tools in monitoring crops to ensure the maximum yield is realized. The use of UAVs is also being used for monitoring remote land areas that are difficult to reach by foot. Amazon recently received approval from the FAA to research the use of UAVs for delivering packages. The uses of UAVs are endless.

Maintaining public parks is a time consuming task that requires a large staff and significant hours to accomplish in a timely fashion. Maintenance crews visit the parks on a regular basis to inspect the grounds and perform any necessary repairs and routine maintenance such as picking up trash, mowing lawns, and inspecting sprinklers, whether or not work needs to be performed at the park or not. City, county, state, and the federal government are responsible for maintaining these places for the public's enjoyment. The Great Recession that occurred in the United States from 2007-2009 caused a decline in tax revenues for governments, forcing cutbacks in parks and recreation departments and requiring supervisors to develop alternative methods of completing the maintenance with smaller budgets and staffs. UAV technology is a possible solution to the problem. UAVs can be flown at any time, can capture high-resolution imagery, and require little labor to operate.

This paper examines the use of inexpensive UAV technology to monitor a park for maintenance purposes. A method for using the UAV for data collection is outlined and carried out at Deleo Regional Sports Park, a public park in Temescal Valley , an unincorporated area of western Riverside County in Southern California.. The results of the UAV data are used for digitization and creating Normalized Differential Vegetation Index (NDVI) output. The results of the digitization and NDVI output are compared to ground truth data collected with a GPS receiver and NDVI outputs created with United Stated Geological Survey (USGS) Landsat 8 imagery for accuracy. Lastly, the

observations of the results of the study are examined to determine the cost benefit of using the UAV versus a GPS receiver and hiring manned aircraft.