



University of Mississippi Geoinformatics Center

A Mississippi Mineral Resources Institute Program

Oxford Tree Canopy Study

Funded by: The Oxford Tree Board

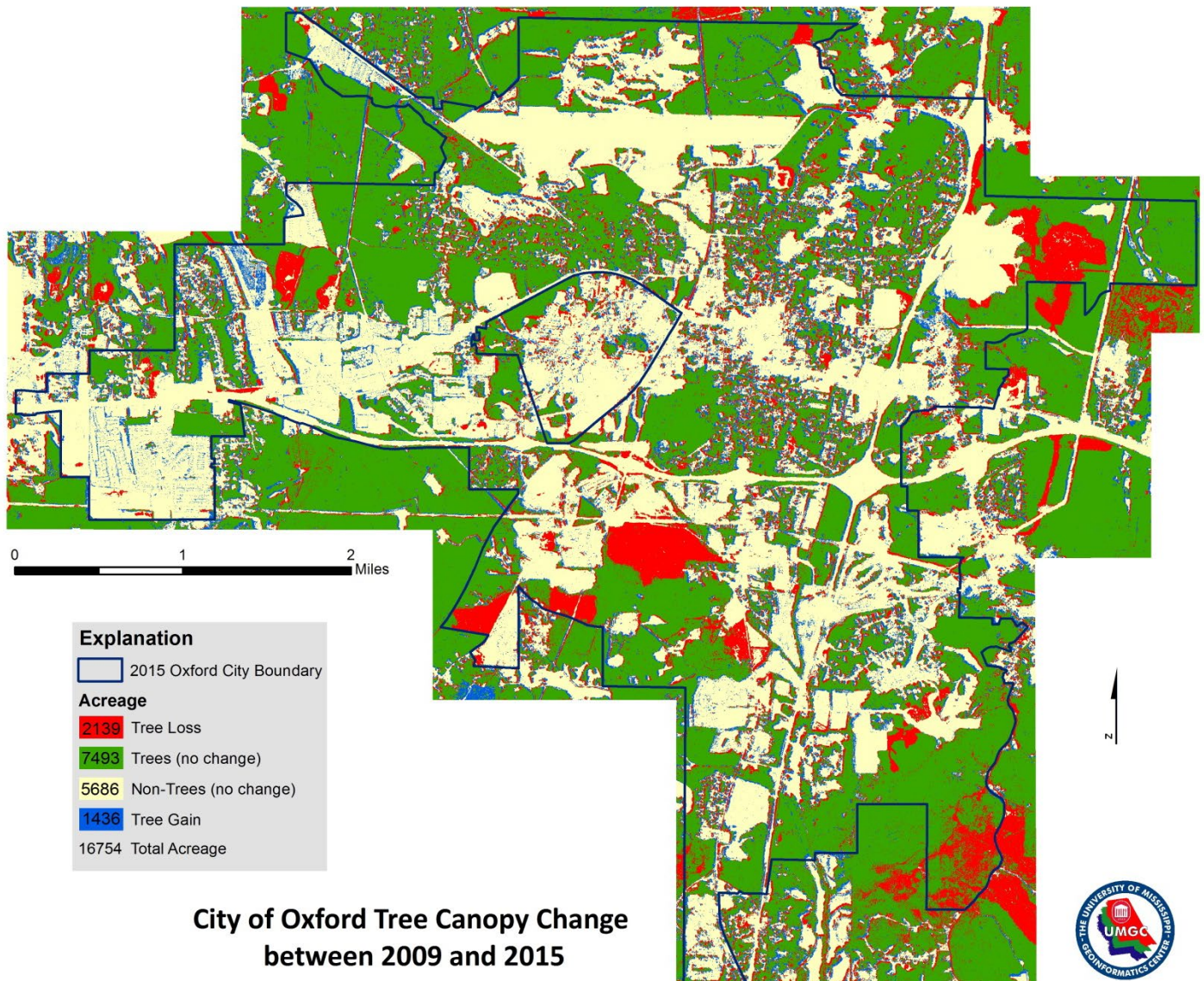
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Introduction

The 2015 evaluation of the tree canopy for the City of Oxford is similar to a study conducted by UMGCI in 2009. Imagery from 2009 and 2015 were analyzed individually and then merged to show where areas of no change, tree loss, and tree gain occurred. Since the study area changed from the previous study, the 2009 imagery required reclassification.

Procedure

Two sets of imagery were used for this comparison: 2009 and 2015 satellite imagery for the City of Oxford. Classes that corresponded to trees, asphalt, water, grass, and others were used to define the data. This was done for both images, but classification had to be performed on an individual basis. The classes were further simplified into two classes: trees or non-trees. A process was used to remove classified areas (polygons) that were smaller than a few pixels in size. Manipulation of the polygons was minimal due to time constraints, but obvious errors in classification were manually corrected. A function called "Minus" combined the two datasets into one which indicated areas of no change for trees and non-trees, tree loss, and tree gain (shown below).



Results

The results listed in the table below may vary slightly from the values in the previous figure.

2009-2015 Tree Canopy Study				
	Acres		Sq. Miles	
Tree Loss	2139.0		3.3	
Trees (no change)	7492.6		11.7	
Non-Trees (no change)	5685.8		8.9	
Tree Gain	1436.2		2.2	
	Trees (acres)	Non-Trees (acres)	Trees (sq. miles)	Non-Trees (sq. miles)
2009	9631.8	7120.8	15.0	11.1
2015	8929.2	7825.1	14.0	12.2
	Change (acres)		Change (sq. miles)	
2009-2015	-702.6	704.3	-1.0	1.1
negative values indicated a "loss" of reported area				
	Area Sum (acres)		Area Sum (sq. miles)	
2009	16752.6		26.2	
2015	16754.3		26.2	
	Error (acres)		Error (sq. miles)	
2009-2015	1.7		0.0	
	Trees %	Non-Trees %		
2009	57.49	42.51		
2015	53.29	46.71		
Change	-4.20%			

Error

The observed error between the 2009 and 2015 datasets was +/- 1.7 acres, however this value is likely greater. The 2015 image was a composite image of two strips taken on different days. These strips did not match up perfectly due to edge/lens distortion that warped the images. The sun angle and camera angle were also different. These two strips were processed separately when classifying trees vs. no trees and then combined to make one dataset for 2015. The 2015 data was off when overlaying it on the 2009 data and this was most likely caused by the previously mentioned distortion. This error still seems to be rather small because known areas of tree loss like the new hospital and new high school seem unaffected.