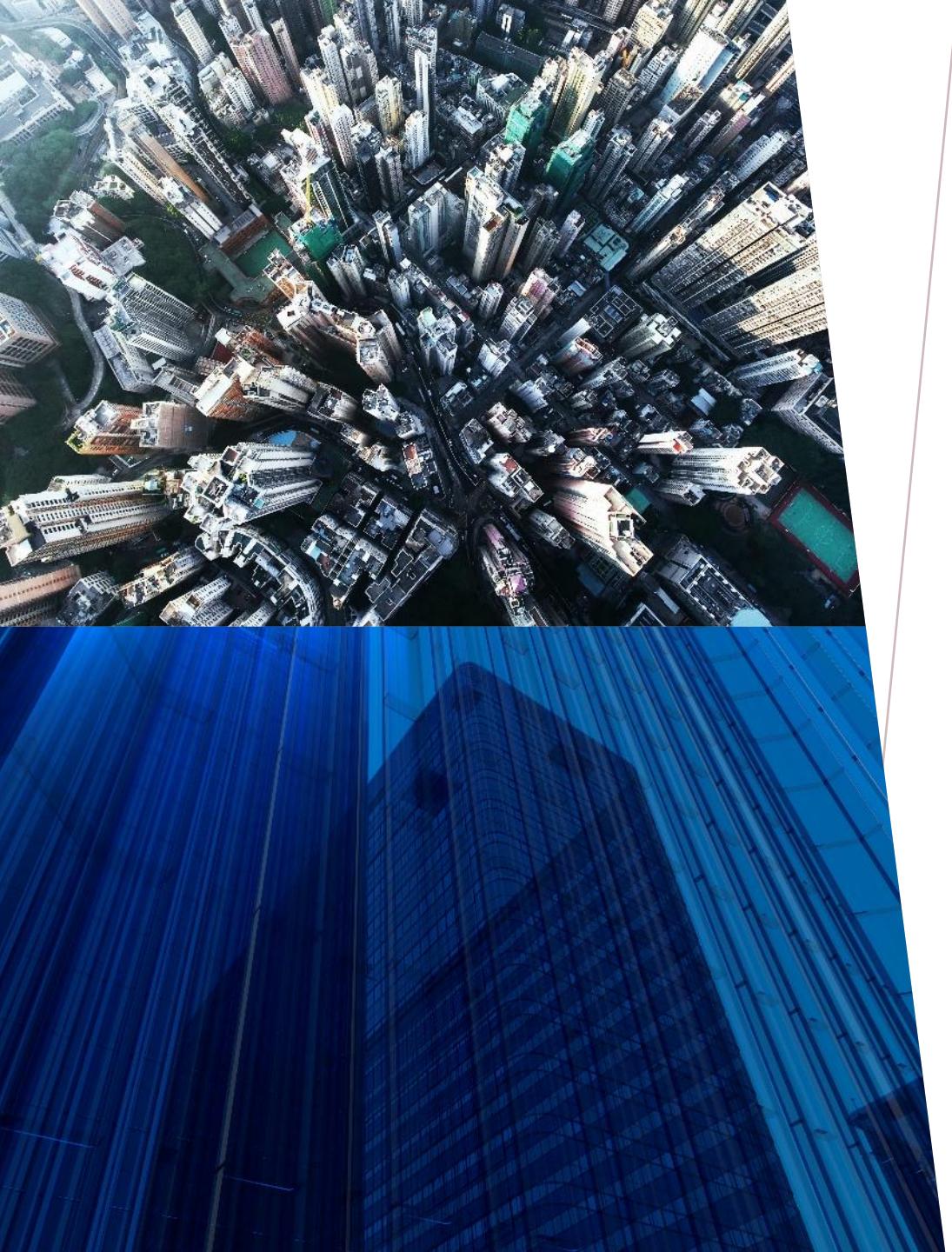


URBAN CHANGE ANALYSIS

David Cardenas Ochoa



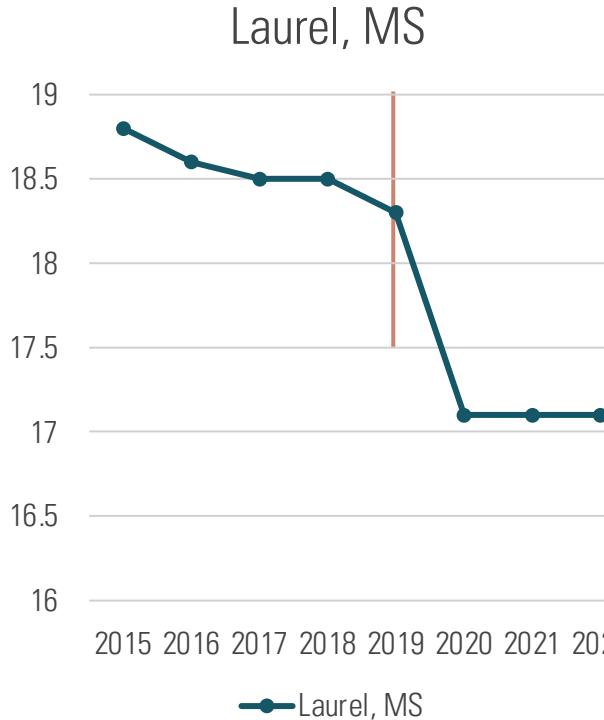
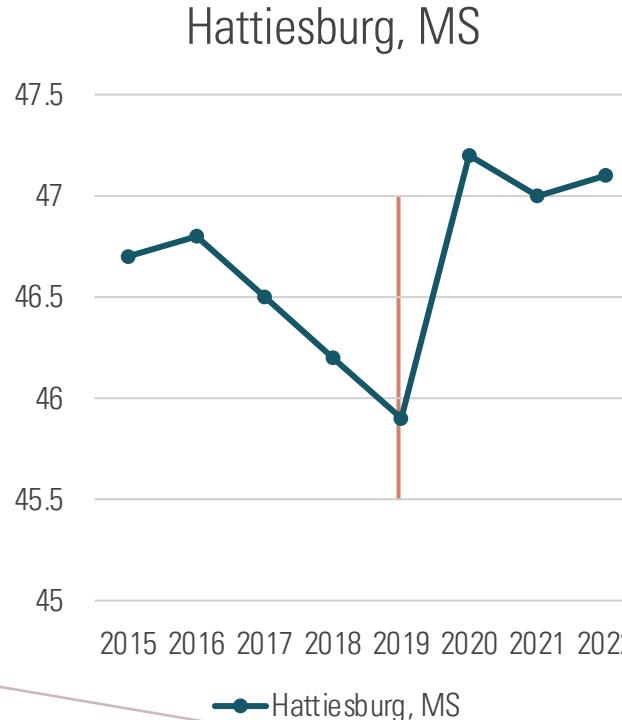


BACKGROUND INFORMATION

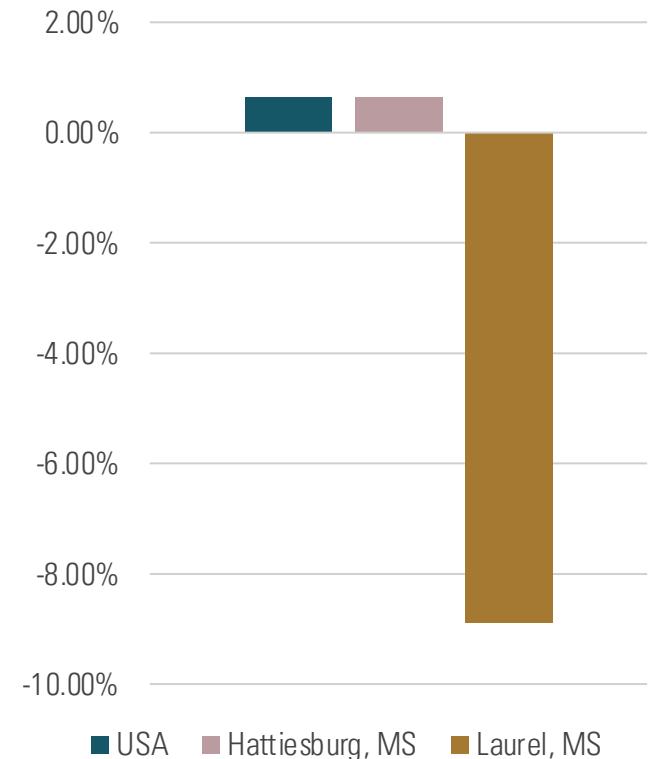
An urban change analysis was performed on an image of the area of Hattiesburg, Mississippi. The time gap between both images is seven years, between 2015 and 2022. Over this period, the city has seen its population increase at the same rate as the United States population. In contrast to Hattiesburg, Laurel, a city just north of Hattiesburg, has seen a slower population growth than both the US and Hattiesburg. Due to the different population growth, an urban analysis was done to visually see the differences in how two close cities grow at different rates.

POPULATION STATISTICS

POPULATION GROWTH



7-Year Average Population Growth Rate



SUBSET IMAGES

Natural Colour Map of Hattiesburg, Mississippi, USA

September 14, 2022



Natural Colour Map of Hattiesburg, Mississippi, USA

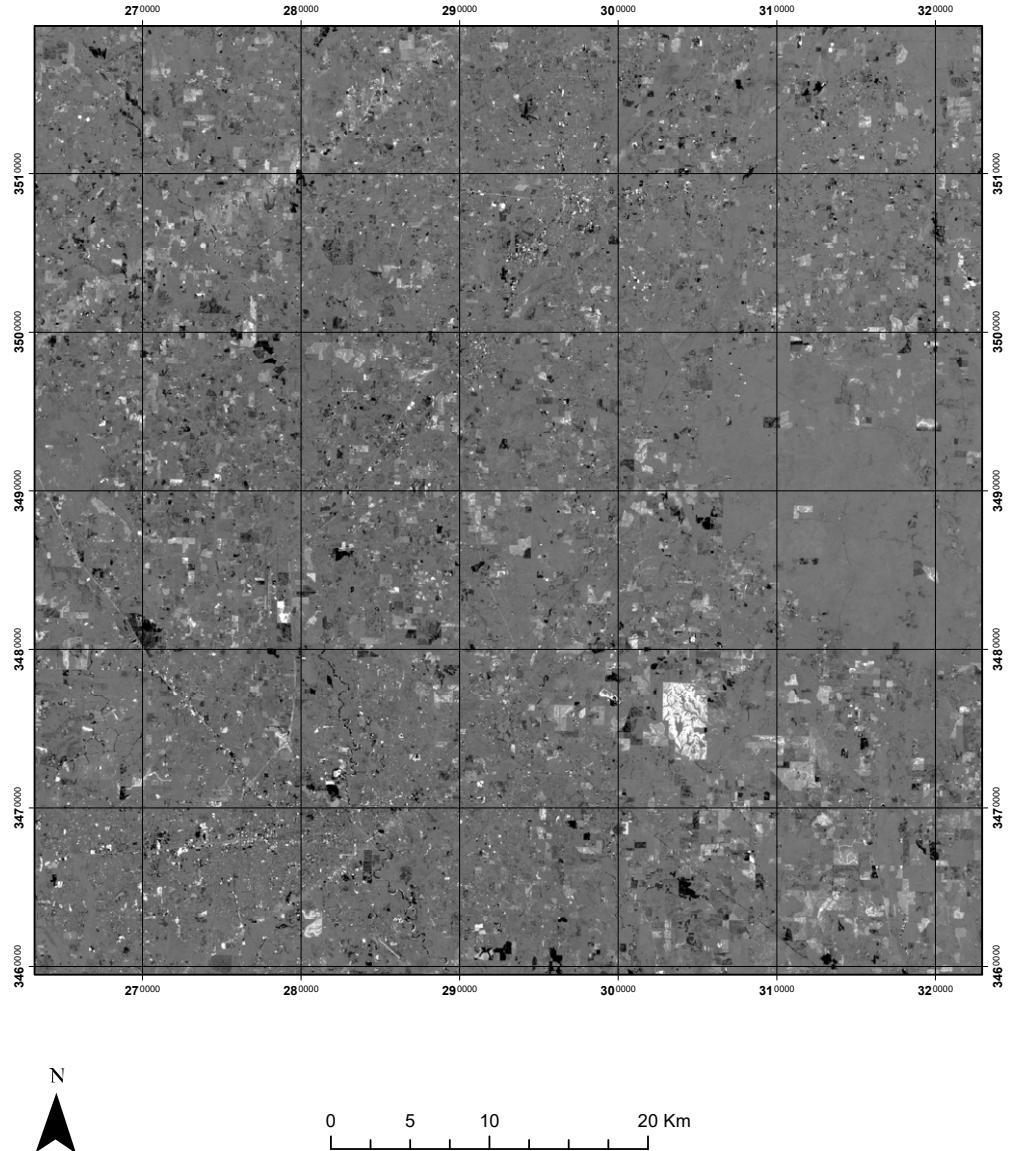
September 19, 2015



DIFFERENCE AND CHANGE IMAGE

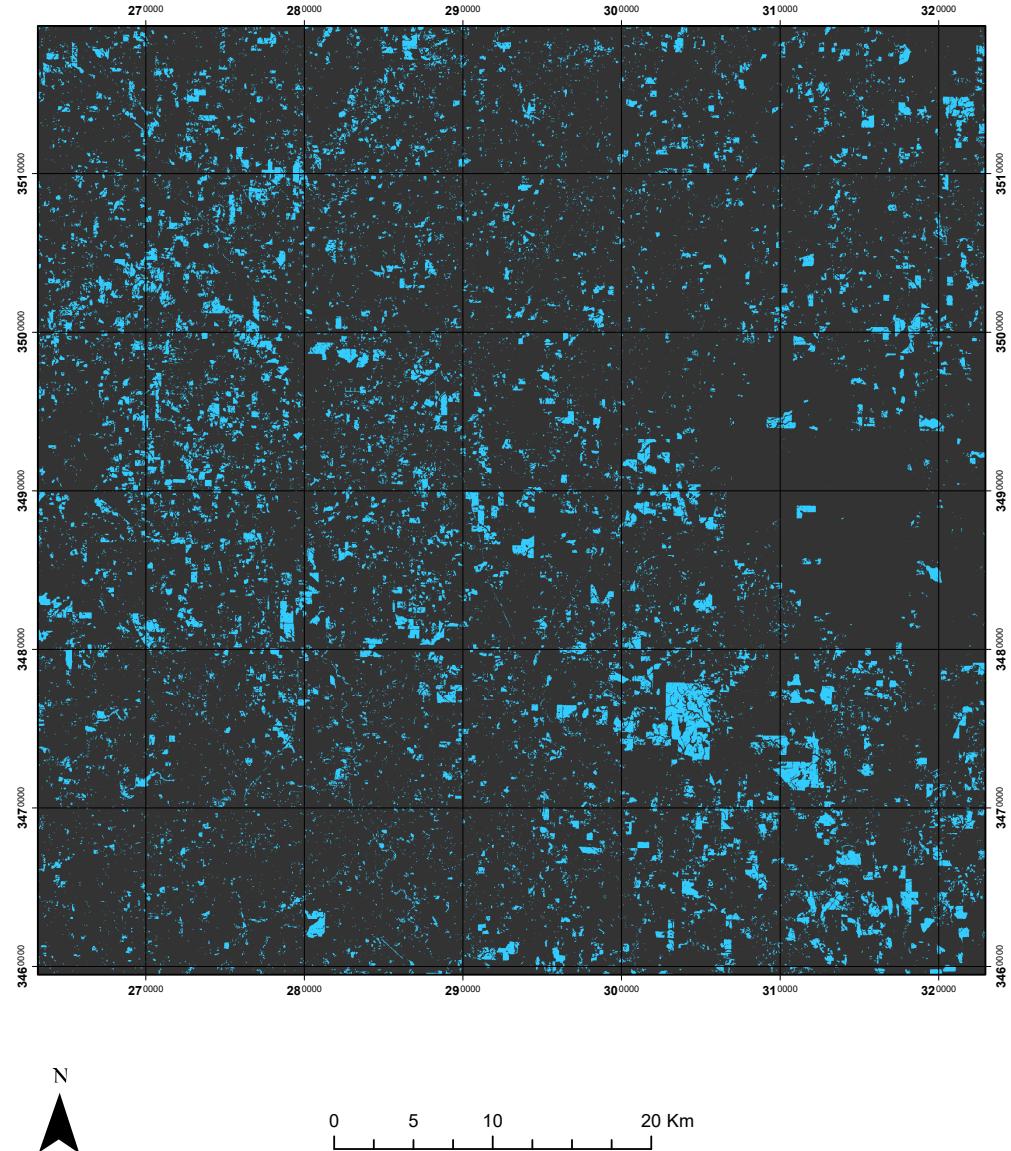
Difference Image Map of Hattiesburg, Mississippi,

September 14, 2022



Change Image Map of Hattiesburg, Mississippi, USA

September 14, 2022



UNSUPERVISED CLASSIFICATION RESULTS

Unsupervised Classification Result of Hattiesburg, Mississippi, USA

September 14, 2022

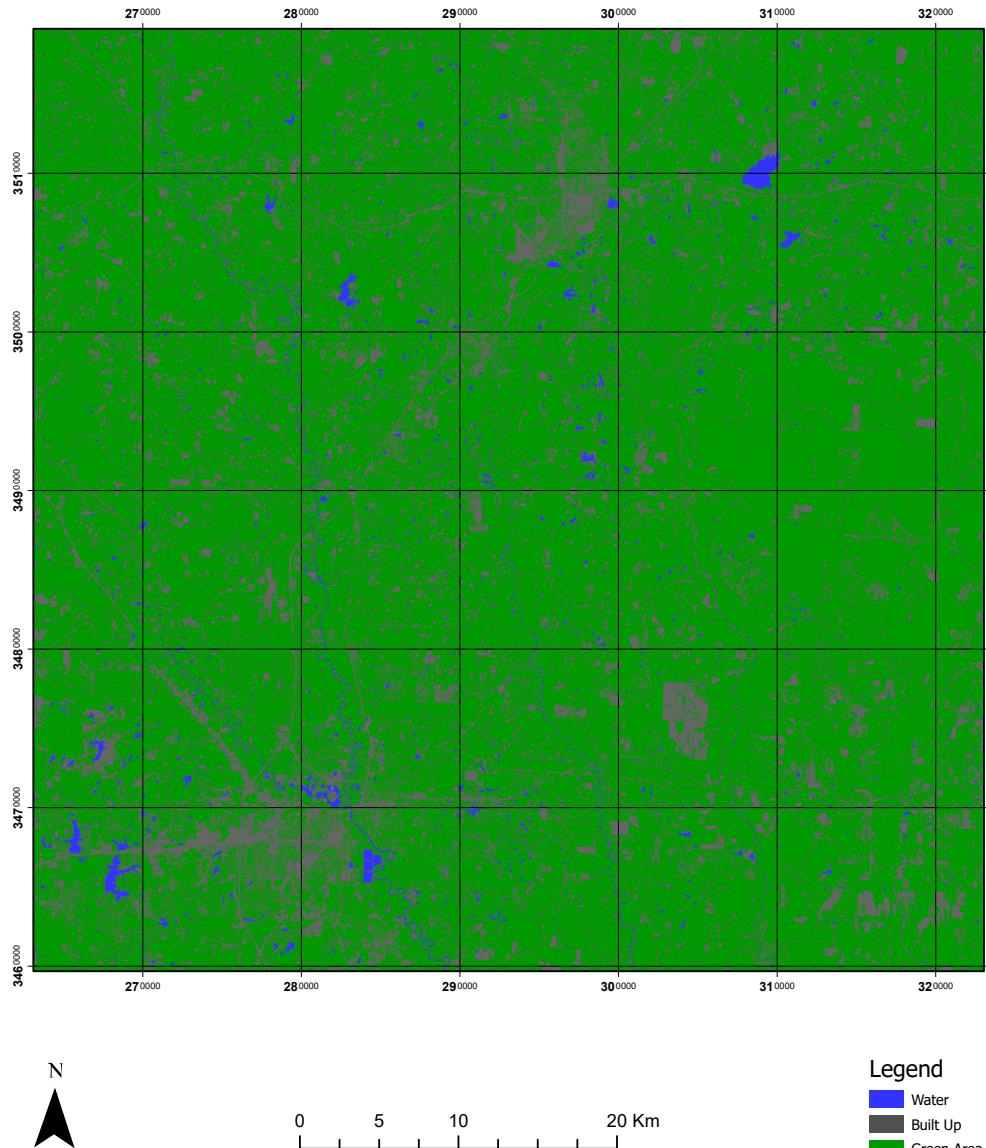


TABLE 1

		Error (Confusion) Matrix			
		Reference Data			
Classified Data		Water	Built Up	Green Space	Total
Water	Water	2	2	0	4
Built Up	Built Up	0	24	12	36
Green Space	Green Space	1	23	136	160
Total	Total	3	49	148	200

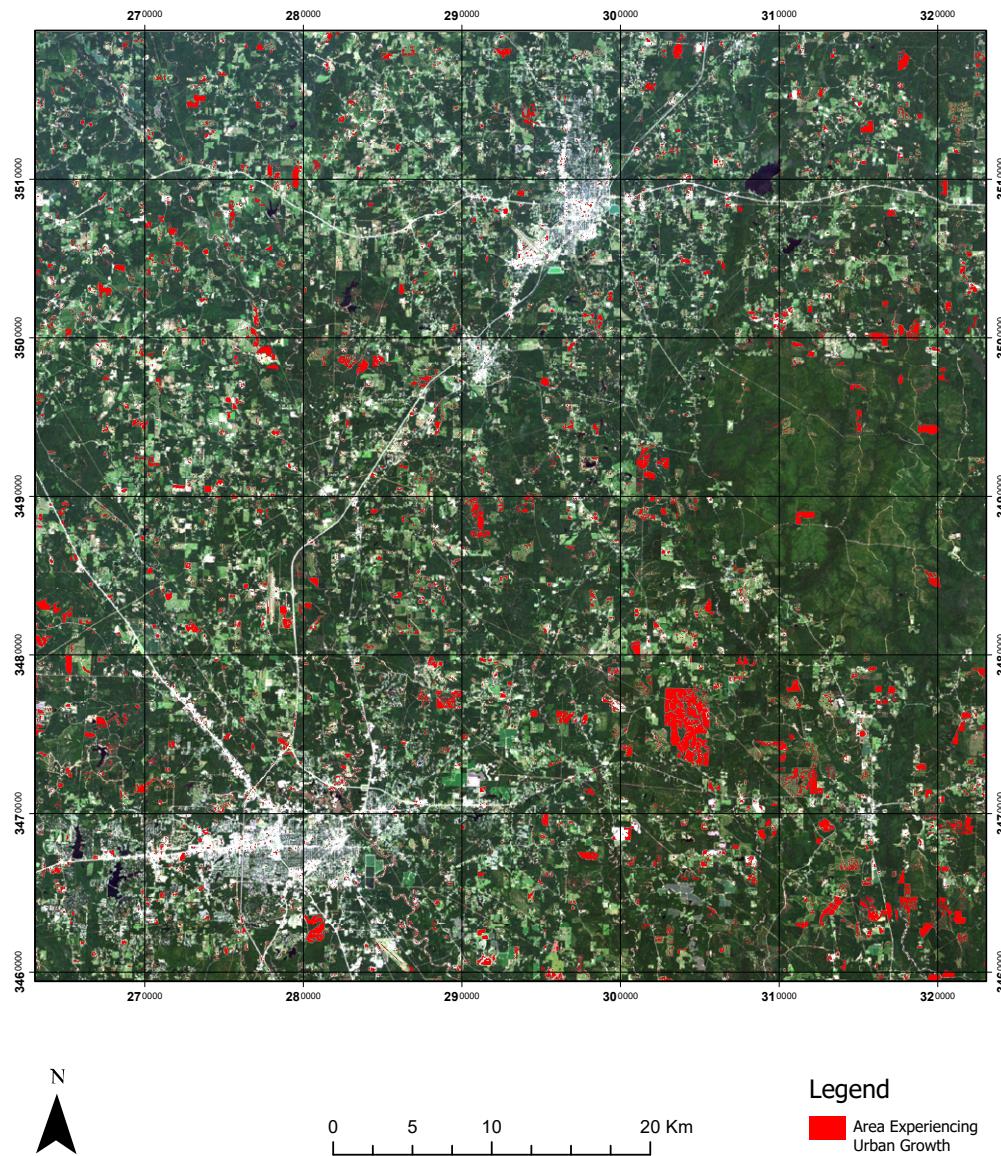
TABLE 2

Overall Accuracy: 81.000%			Confidence Interval (75.313% - 86.687%)		
Overall Kappa Statistic: 0.477			Overall Kappa Variance: 0.142		
Water	Producer's Accuracy	95% Confidence Interval	User's Accuracy	95% Confidence Interval	Kappa Statistic
Built Up	66.667%	-3.344% 136.678%	50.000%	-11.500% 111.500%	0.4924
Green Space	48.980%	33.962% 63.997%	66.667%	49.879% 83.455%	0.5585
Total	91.892%	87.156% 96.627%	85.000%	79.155% 90.845%	0.4231

CHANGE DETECTION RESULT

Change Detection Result of Hattiesburg, Mississippi, USA

September 14, 2022



SUMMARY

As seen through the analysis, there has been a more urban change in the area closer to Hattiesburg than Laurel. Specifically, east of the city of Hattiesburg, there is heavy development underway or finished. The Error (Confusion) Matrix and the Kappa statistics show that the analysis can be trusted as it received an overall Kappa score of 81%.

