



Growth in the Grand Strand: Urbanization of Myrtle Beach, South Carolina In The Past 20 Years

Remote Sensing in Environmental Analysis

GGY 422/522, Spring 2011

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-Introduction: Since the early 1900's Myrtle Beach has been utilized as a resort destination. According to Trip Advisor's *Traveler's Choice* "Myrtle Beach is the United States #1 Beach & Sun Destination and #5 in the World." Believe it or not, the "Grand Strand" at Myrtle Beach has witnessed an enormous amount of economic growth and this has led to urban sprawl across the coastal plain of South Carolina.

How much growth has Myrtle Beach experienced in the last 20 years?

-Abstract: Using remote sensing, this study will determine the land class change between 1990 and 2010 to determine the extent of Myrtle Beach. The amount of growth can be assessed for the last twenty years and future urban sprawl can be determined. The study can help to provide a direction of growth for city planners to consider in future development.

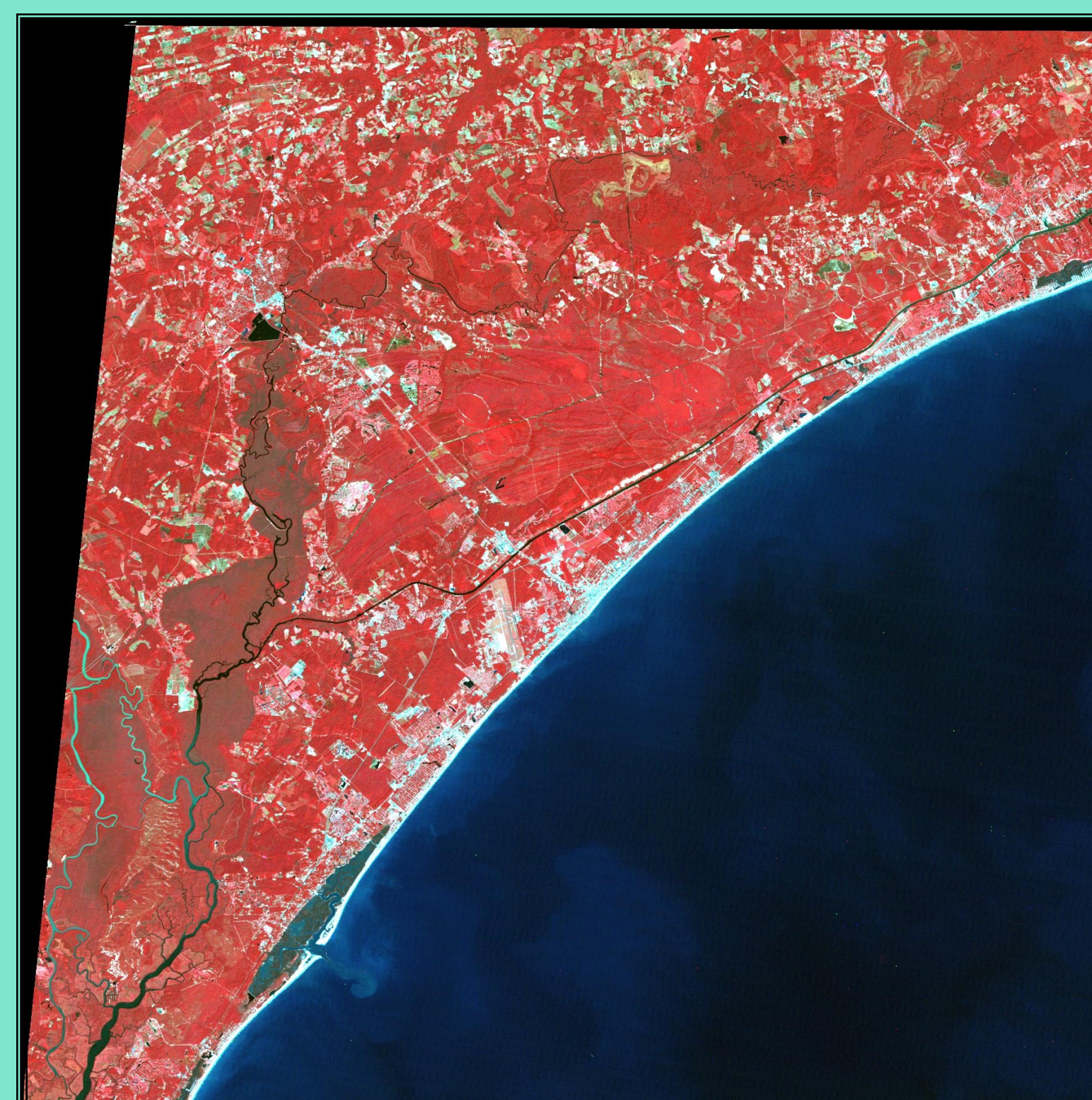


Figure 1: Myrtle Beach, SC 1990 - Landsat TM, False Color



Figure 2: Myrtle Beach SC, 2010 - Landsat TM, False Color

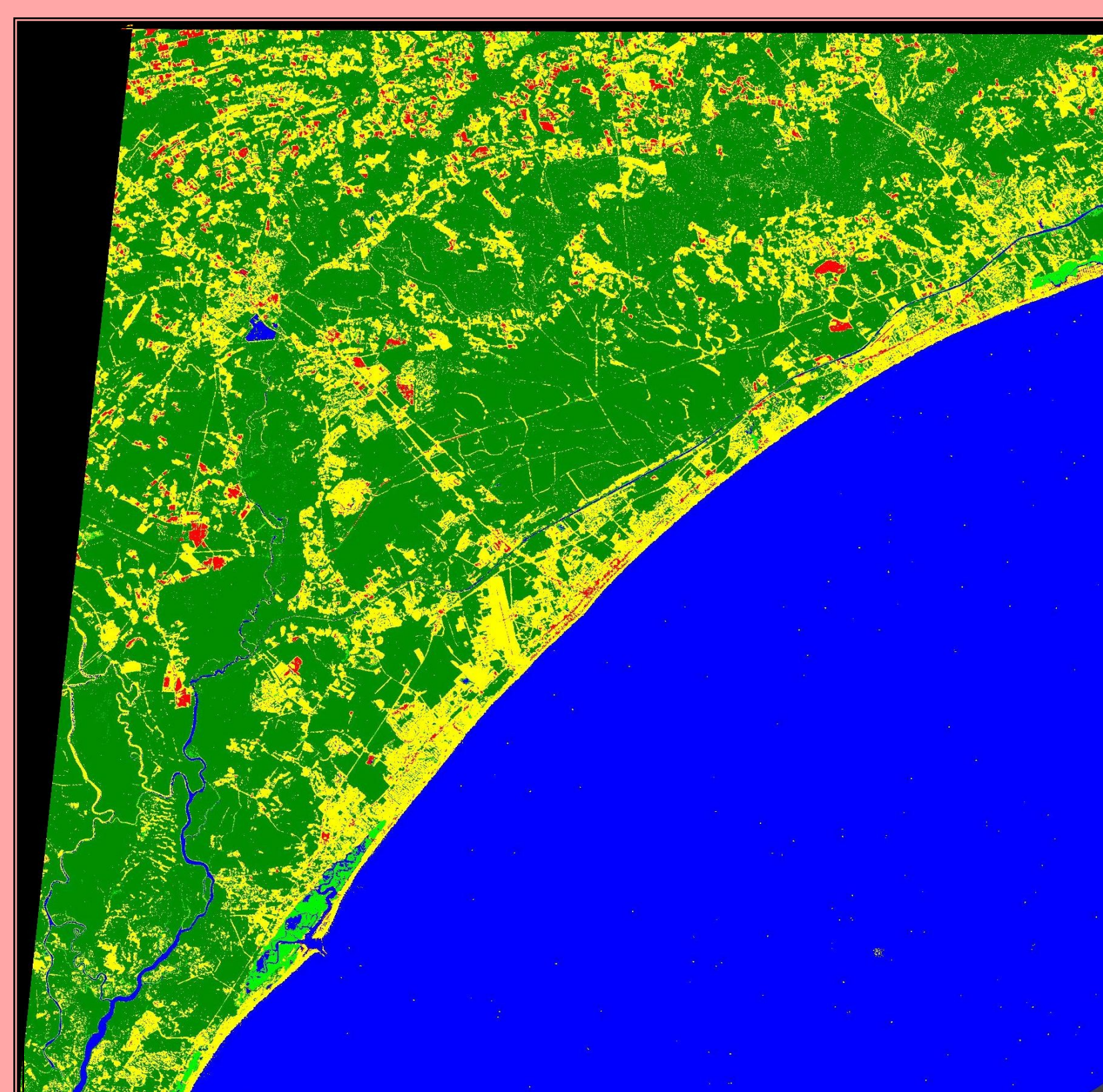


Figure 3: Myrtle Beach SC, 1990
Confusion Matrix: Myrtle Beach 1990
Overall Accuracy = (940/941) 99.8937%

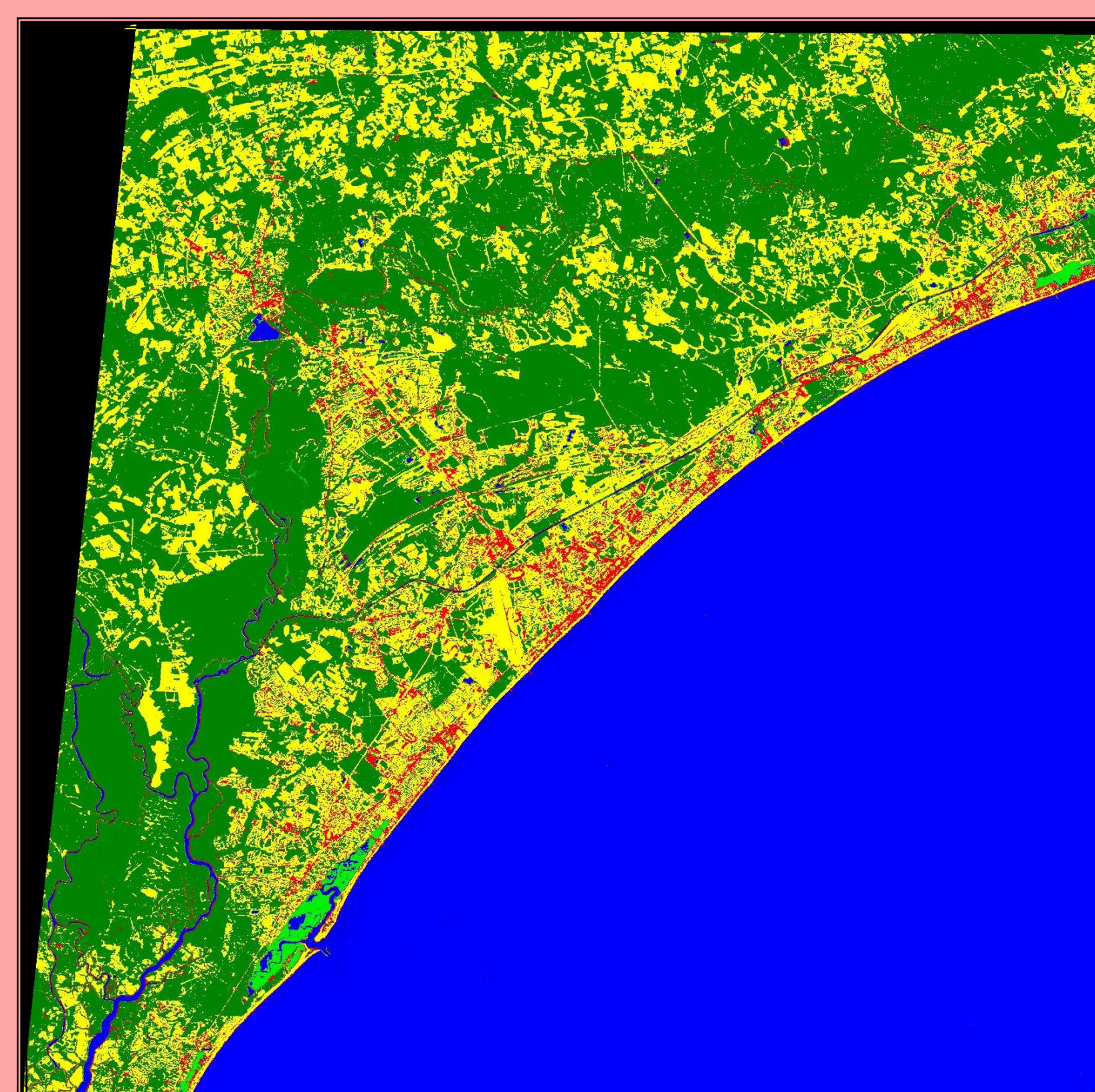


Figure 4: Myrtle Beach, SC, 2010 - Landsat TM, Classified Image
Confusion Matrix: Myrtle Beach 2010
Overall Accuracy = (1187/1188) 99.9158%

-Methods: Two images will be compared from 1990 and 2010 using Supervised Classification and Maximum Likelihood. Figure 1 and Figure 2, the false color images were used for determining the regions of interest. These regions were then assessed and used to classify the entire image. This process was repeated for each date and an accuracy assessment was completed for each as well. The classified images are shown in Figure 3 and Figure 4 along with the Overall Accuracy percentage.

After the images are properly classified they can be compared using the change detection procedure that determines the difference.

Area (Square Km)	water [Blue]	110716 points	sand [Yellow]	451 points	marsh [Green]	1237 points	vegetation [Green3]	1737 points	urban
[Red]	154 points	Row Total	Class Total						
Unclassified	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
water [Blue]	58110 points	1083.81	0.91	0.02	1.27	7.81	1093.82	1093.82	
sand [Yellow]	538 points	0.28	295.79	7.55	154.60	12.26	470.48	470.48	
vegetation [Green3]	2702 points	0.00	0.00	87.60	16.50	589.66	7.15	700.91	700.91
marsh [Green1]	2174 points	0.00	20.14	62.84	49.68	2.45	135.12	135.12	
urban [Red]	207 points	0.40	15.94	0.91	15.69	36.40	69.35	69.35	
Class Total	1084.49	420.39	87.81	810.90	66.07	0.00	0.00		
Class Changes	0.69	124.60	24.97	221.24	29.66	0.00	0.00		
Image Difference	9.32	50.08	47.30	-109.99	3.28	0.00	0.00		
	Water	Sand	Marsh	Vegetation	Urban				

-Results: The change detection statistics shows that there has been a significant decrease in vegetation, a loss of 109.99 sq. Km. The Grand Strand has gained 9.32 sq. Km. of water and 50.08 sq. Km. of sand due to it being home to Golf Digest's "Super 60" golf courses.

-Conclusion: The main interest in this study is the increase of urban buildings and infrastructure. The change detection shows an increase of 3.28 sq. Km. of urban structure in the last 20 years.

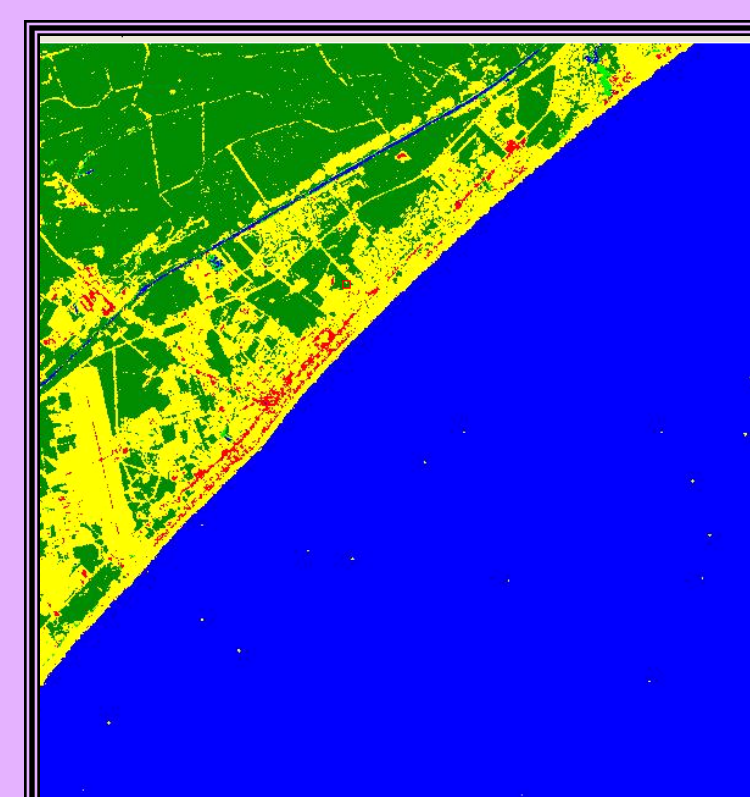


Figure 5: Zoom Image; Myrtle Beach, SC 1990

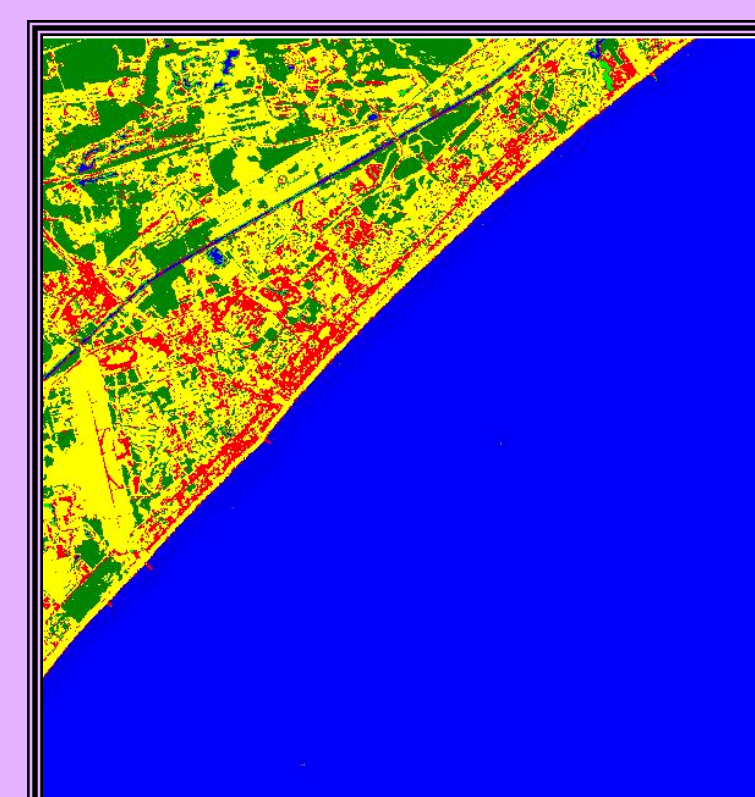


Figure 6: Zoom Image; Myrtle Beach, SC 2010

-Recommendations: City Planners of Myrtle Beach should aware of this loss of vegetation and its replacement with tourist attractions. If development continues there will be less and less and less natural vegetation available for tourist to enjoy.

Acknowledgements: -Eman Ghoneim, Assistant Professor, GIS
-Sam Hilliard, Teacher's Assistant

References:

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