Measuring the Land Use Efficiency of the Rhode Island Economy

Overview

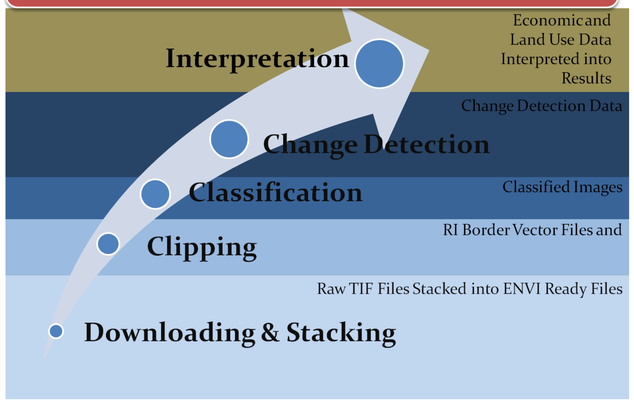
What? Comparison of Change in Land Use with a change in the Economy

When? Data from 1987 and 2000 was used during the study.

How? Multiple Image Classification, Change Detection, and Regression Techniques were used.

Why?
- If we understood the how the economy used land, regulators could guide the economy in ways that conserve land, ultimately stimulating the economy and preserving the environment.

The Process



Introduction

The purpose of this study was to look for a correlation between the changing land use of Rhode Island and its economic growth. To do this, a Landsat TM image from 1987 and a Landsat ETM image from 2000 were downloaded, stacked, and clipped by the Rhode Island border.

Methodology

The images were classified by the K-means method using multiple combinations of classes and iterations over the course of several runs. However, as described by the middle image to the right, no K-means method could differentiate between forest and fields, which was thought to be correlated to economic growth. Therefore, a supervised maximum likelihood was used. Finally, a change detection analysis was completed for the two images and correlated to economic data.

Results

There was no correlation between the change detection results and the economic changes over the same time period. Further analysis should include analyzing more years using higher resolution imagery such as ASTER images rather than Landsat.

Original 1987 Lansat TM Image

Original 2000 Landsat ETM Image

Supervised Classification Accuracy Results

Date	Kappa Coefficient	Accuracy
1987	.9643	98.42%
2000	.9932	99.55%

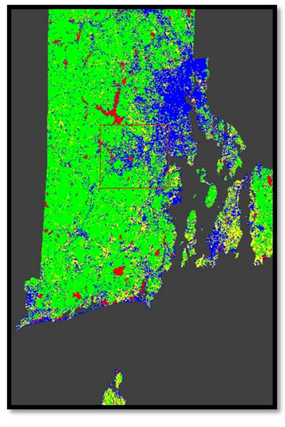
Change Detection Results

	Cleared Non Grass	Fields	Inland Water	Vegetation
Difference in Area Between Images	-10.51%	15.624%	7.653%	1.032%

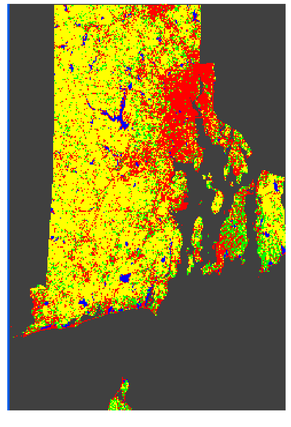
Change Detection Results

Year	RI GDP ($billions)	RI Household Income ($)
1987	18.1	46,207
2000	33.6	51,056

Classified 2000 Image

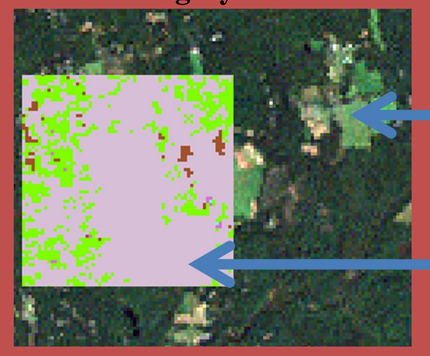


Classified 1987 Image

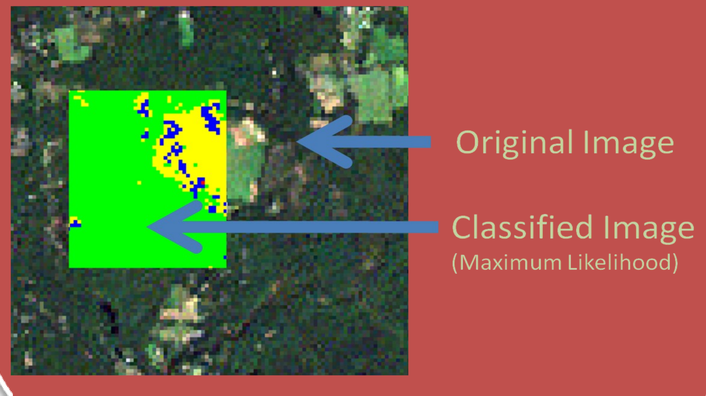


Original 2000 Landsat ETM Image

K-Means classified image overlaid onto original Imagery from 2000 Landsat ETM



Classified image using supervised maximum likelihood overlaid onto original imagery from 2000 Landsat ETM



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