

## **Abstract**

### **EVALUATION OF CHANGES IN LAND USE**

### **AT POINT LISAS INDUSTRIAL ESTATE**

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Mapping and monitoring changes in land use and land cover types in a region is a topic for a large amount of research and reports. Typically, such a task would utilize multi-temporal data from one or more space-born sensors as input. An automatic change detection procedure would, subsequently, follow one or more of fairly well established techniques. One major source for disparities in the implementation is the varying spatial or spectral resolutions of the multi-sensor input data.

The data available for this project are a digital satellite image of one date (Landsat TM image dated 1984) and a digital vector map of a different date (1997). Obviously, these two data sets are in different formats, sources, scales, map projection, and dates. Consequently, the integration between these two data sets is not a straightforward approach. The objective for this study is then to investigate and evaluate the use of these multi-source, multi-format, and multi-date data sets for identifying areas of land use and land cover changes.

The site of the project is Point Lisas Industrial Estate, an area on the west coast of Trinidad. Since the discovery of large oil deposits in the region, the area has been going through continuous changes in the patterns of land use and land cover. The information on these patterns is of a great importance for the planning and management of the natural resources, as well as protecting the wetlands in the region.

The approach adopted for this study is as following

- Editing the vector map of 1997, extracting the land use and land cover classes, and exporting the results into a raster-based GIS.
- Georeferencing the satellite image of 1984 using the image-to-map registration method as well as coordinates acquired by GPS for a set of ground control points.
- Classifying the multi-spectral image. This step should consider the scale difference in both data, and therefore, the degree of generalization.
- Investigating several change detection methods to map areas of changed land use or cover once all data sets are of same format, map projection, and coordinate system.

The report reaches the conclusion that visual interpretation with manual digitization of the categories for land cover and land use is an approach that is more suitable for the objectives of this study. It allows the operator to generalize the details instantly and intelligently. This approach succeeds in extracting the information on the land use from satellite imagery in an identical mode to the classes extracted from 1997 map. The report examines different procedures for manipulating this information by geographic information system in order to arrive to the particulars of the changes in land use and cover in the area.