

## ABSTRACT

This research demonstrates a method for class change analysis called 'pattern of changes' using more than 2 multitemporal images mutually. This method is developed using state digraph approach. The pattern of class changes will be applied into 2 types of states or classes, i.e. the changes of landcover class and of turbid water bathymetric class. Landcover class shows the state of landcover, while turbid water bathymetric class shows the grade of the water depth. Landcover classes were determined using combined methods of unsupervised and supervised classification, while turbid water bathymetric class was processed using spectral analysis of Landsat Thematic Mapper (TM) band-2 and field bathymetric data.

Prediction schemes were also conducted for both landcover and turbid water bathymetric classes. Prediction processes for landcover class were carried out using field data, interpretation of Landsat TM images and landcover class images, and statistical analysis. Prediction processes for turbid water bathymetric class were conducted using field data, Landsat TM images, and time series analysis. The prediction results on both classes were then animated on the display screen to visualize the progress of the class changes.

The model of biogeophysical environment changes in the coastal zone using Landsat TM imageries presents the pattern of changes and the predicted changes for both landcover and turbid water bathymetric classes. The pattern of changes and predicted changes for the two classes were spatially and statistically presented, so the observer can interpret the changes in coastal zone as shown on the computer monitor screen.

Generally, it can be stated that the landcover of the study area in Mimika Regency did not change (91.5%) in 11 years (1988-1999). The landcover class changes that can be spotted from the model is between water and vegetation classes (4%) and the pattern of the changes is fluctuative. The changes show that there is a dynamic progress in the shoreline with new mangrove seedling. On the other side, the bathymetric class changes happened in almost all the water area in Mimika Regency (99%). In the period of 1988-1999 (11 years), the trend of the bathymetric changes is toward shallow water. The bathymetric prediction analysis also shows the similar trend.