

# INTEGRATION OF MULTITEMPORAL SATELLITE IMAGES AND HISTORICAL MAPS FOR WETLAND MULTI-SCALE MONITORING

Ming-Chee Wu <sup>1</sup>, Mon-Shieh Yang <sup>2</sup>

<sup>1</sup> Professor, Department of Earth Sciences, National Cheng Kung University,  
1 Tamsue Road, Tainan City, 70101 TAIWAN, R. O. C.  
E-mail: [mcwu@mail.ncku.edu.tw](mailto:mcwu@mail.ncku.edu.tw)

<sup>2</sup> Ph.D. Candidate, Department of Earth Sciences, National Cheng Kung University,  
1 Tamsue Road, Tainan City, 70101 TAIWAN, R. O. C.  
E-mail: [MSYang@IEEE.org](mailto:MSYang@IEEE.org)

## ABSTRACT

Maps are the most direct and lucid measures to represent and record the geographic environment. As a result, by overlaying maps with different ages can provide the long-term measures of the landform changes through the geographic processes; which may be quantitatively analyzed. However, on the other hand, satellite images can be implemented for short-term investigations on wetland changes caused by a sudden hazard event. The scope of this study is to develop an effective method for monitoring and evaluating environment changes of coastal wetland.

In this study, recent multi-temporal satellite images together with some middle-scale maps of Taiwan made during and after Japanese Colonial Period, i.e., Taiwan Bau-Tu in 1904, Taiwan Measured Topographic Map in 1924, Economic Planning and Development I Topographic Map in 1985, and Economic Planning and Development III Topographic Map in 1999, are adapted for landform changes measurement of a regional coastal wetland; the Qigu Wetland. In addition, Multi-spectrum satellite images which were made with different scale in different time period were adapted to identify the environmental changes as well as the spatial analysis for land cover investigation.

It was concluded that the study has shown that local spatial autocorrelation should provide objective classification in training stage, and the spatial autocorrelation can also enhance the pattern of vegetations and water bodies on images.

Keyword: Coastal Wetland, Land-Cover Evaluation, Image Classification, Spatial Autocorrelation