

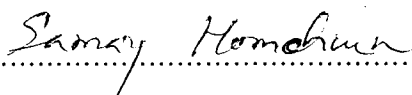
THESIS TITLE : AN APPLICATION OF REMOTELY SENSED DATA AND
GEOGRAPHIC INFORMATION SYSTEM FOR WETLAND
ECOSYSTEM MAPPING

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ABSTRACT

Wetland is area of biodiversity and is important to natural heritage and culture. Substantial value of wetland has been well recognized by a number of agencies in terms of ecosystem balance and economy. Capacity of wetland to support biomass is decreased with an increasing demand for resources in the development activities.

The objectives of this study were to establish methodology for wetland ecosystem analysis using satellite data and Geographic Information System and to design spatial data structure and its associated attributes

The study area,the Songkram watershed of an area about 1,308,147 ha, covers in four provinces in Northeast Thailand. This includes Nongkhai, Udonthani, Sakon Nakhon and Nakhon Phanom. Geologically the area is underlain by Mesozoic rock of the Maha Sarakham Formation. The landscape is gently undulating to flat plain, with Phu Phan mountain ranges in The South. The spatial rainfall distribution is increasing from South to North. In the rainy season the depression areas of Songkram river and its

tributaries are periodically flooded. The landuse patterns in the area are restricted to paddy, field crops, isolated patches of forest remnants and riparian woods.

The wetland classification system used is modified from that of DUGAN 1990. There are 4 categories : Type, System, Subsystem and Class. The methodology to generate wetland map included data collection, database establishment, overlay analysis and output generation. Data to be used in the analysis can be acquired from existing map, satellite imagery ,ground truth survey and other statistics. Spatial data was georeferenced based on the UTM coordinates. Data conversion was performed using PAMAP GIS. The data was organized by theme into layers. Bridging spatial data and its associated attributes was done through the use of database tags with corresponding codes. The theme layers are water resources (streams, reservoir), soil type, saline soil, geology, landform, water salinity , stream size, irrigation area and etc. With the set of theme defined in the classification system, spatial modeling can be performed accordingly. There are 23 wetland units resulting from the overlay analysis of the defined theme layers. Each unit has a range of information on which the detailed study was based. Selected sites of important wetland unit were also studied in terms of water quality, physical and biological components as well as birds and fish diversity. In addition, The establishment of spatial database and its associate attributes was carried out. The database developed provides a tool to formulating spatial model for wetland ecosystem best suited for Songkram Watershed Management.