Thesis Title	QUALITATIVE AND QUANTITATIVE ANALYSIS OF LANDSAT MSS DIGITAL DATA TO STUDY SUSPENDED SEDIMENT DISTRIBUTION IN THE UPPER GULF OF THAILAND
Name	Supranee Kovantanakul
Degree	Master of Science (Technology of Environmental Management)
Thesis Supervisory Committee	Thanakorn Uan-On, Ph.D. Darasri Srisaengthong, Ph.D. Boonchana Klankamsorn, B.Sc.
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Abstract

Since the launch of Landsat-1 in July 1972, the satellite data have proved to be useful for studying many aspects in oceanography. Investigation of suspended sediment concentration in water bodies is one of the major areas of Landsat application. This study determines the usefulness of Landsat Multispectral Scanner (MSS) digital data for mapping surface suspended sediment in estuarine water of the Upper Gulf of Thailand, both in qualitative and quantitative analyses.

Ten Landsat images from the archives since 1973 have been digitally enhanced to reveal qualitative information of suspended sediment patterns by colour density slicing and false colour compositing techniques. It appears that the shape and extent of sediment featuresflowing from the major rivers are much influenced by

the season of river-flow and tidal status. Their subsequent movement is affected by the prevailing winds. The largest sediment patterns produced by the greater river-flow in October-December are transported south or southwest along the northern coastlines by the tidal current in ebb period and the prevailing northeast monsoon winds. The smaller sediment patterns generated by the lower river-flow persist in the direction of south or southwest during the greater northeast monsoon winds in January, but in May such patterns tend to flow east in the first period of southwest monsoon winds. These seem to support the concept of water circulation in that the circulation is counterclockwise during the northeast monsoon and clockwise during the southwest monsoon.

During a year's fieldwork programme, two clear weather images were obtained and the digital Landsat data were extracted to calibrate with suspended sediment concentration collected from the Chao Phraya river mouth. The chromaticity transformation of Landsat data, which permits corrections of sun angle effects and atmospheric disturbance, proved to be useful for establishing a more reliable multi-date algorithm for perdict suspended sediment concentration. A high correlation ($r = 0.95$) with 99% significance is found between the corrected chromaticity coefficients and sediment concentrations based on 24 sampling points for these different scenes. It appears that it may be possible to obtain quantitative information for large estuarine area of the Upper Gulf of Thailand from the archived colour-sliced images, using the calibration algorithm.