

ASSESSMENT OF THE INUNDATION AREA AND VOLUME OF TONLE SAP LAKE USING REMOTELY SENSED DATA & GIS

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The ability of spatial information, including remote sensing and GIS technique, to provide valuable informations in time and space domains has been known to be very useful in providing permanent records by mapping, monitoring and managing flood events. In 2000, floods were at their devastating worst in Tonle Sap Lake, Mekong River Basin, for the second time during July and October. In this study, Landsat ETM⁺ and RADARSAT imagery were used to obtain the basic information for the inundated area using ISODATA classifier and segmentation technique. However, the inundated area derived showed only a small fraction than the actually inundated area because of the cloud in the imagery and complex grounds. To overcome these limitations, the cost-distance method of GIS was used to estimate the inundated area at the peak level by integrating the inundated area from satellite imagery with digital elevation model (DEM). The estimated inundation area was simply converted with the inundation volume using GIS. The inundation volume was compared with the result of hydraulic modeling using MIKE 11 which is the most widely used dynamic river modeling system. Figure 1 shows the map of inundated area derived from the classification rule and thee cost-distance method of the multi-temporal imagery. This method is suitable for estimating inundation volume even when Landsat ETM⁺ has many clouds in the imagery. Also, it is possible to overcome the disadvantage of the use of RADARSAT imagery with the difficult classification of the acquired signal since the influence of complex ground and system variables.

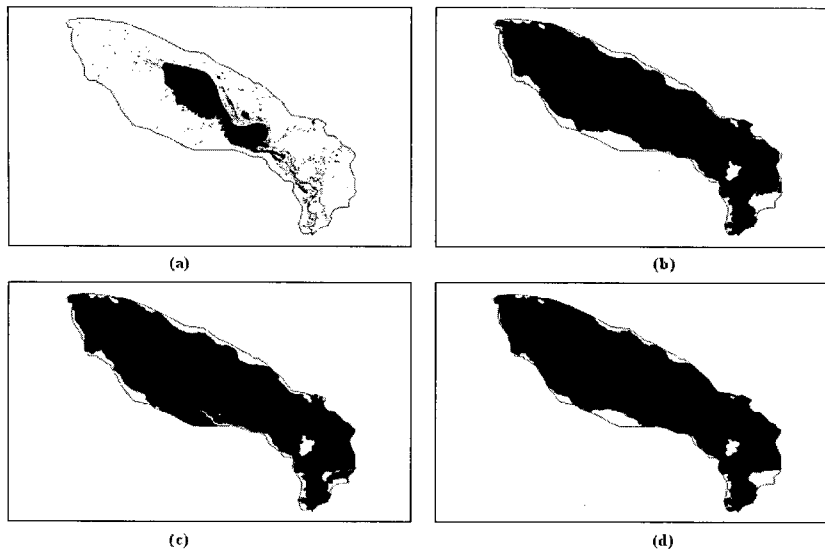


Fig. 1 Image of the maximum extent of inundated area estimated by the classification rule and cost-distance method. (a) Mar 18, (b) Aug 1, (c) Sep 4, and (d) Sep 26.

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