

Assessment of Human Impact on Mekong River Flood by Using Satellite Nightlight Image

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Abstract

High intensity of population distribution in deltaic setting especially in Asia tends to have increased and causes coastal flood risk due to lower elevations and significant subsidence.

Maximum or peak discharge of flood always causes numerous deaths and huge economic losses. New technology of spatial satellite image has been applied to analyze flood damage.

In this research, the relationship of nightlight intensity associated with flood damages has been determined during 1992–2013 with spatial resolution of 30 arc sec (0.0083°) which is nearly one kilometer at the equator in whole six countries along the Mekong River (i.e., China, Myanmar, Lao PDR, Thailand, Cambodia and Vietnam).

ArcGIS Hydrological Flow Length Tool has been used to determine the distance of each pixel areas from the rivers and streams. Statistical analysis results highlight the significant correlation $R = 0.47$ between nightlight digital number and economic damages per unit area (US\$/km²) and $R = 0.62$ for number of affected people for unit area (people/km²).

The areas near by the Mekong River and its tributaries correspond to high flood damage. This spatial analysis result is going to be prestigious key information to the regions and all related stakeholders for decisions and mitigation strategies.

Keywords : nightlight, statistical analysis, flood damage, human pressure

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