
Constructing depth-area-duration curves using public domain satellite-based precipitation data

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Abstract: Dense network of rain gauges are used to accurately characterise the variation of rainfall over a less than ideal region such as Sarawak, Malaysia. This research aims to develop depth-area-duration (DAD) relationships of selected rainstorm event over Sungai Sarawak basin by using public domain satellite-based precipitation data from tropical rainfall measuring mission (TRMM) product. Geographic information system (GIS) was used to manipulate the three-hourly accumulated precipitation dataset from TRMM and

subsequently used to investigate spatial and temporal pattern of rainstorm. The findings suggested that rainfall depth decreases with increasing area for a given duration. This also implies that the remotely sensed information from TRMM product can be used as an alternative source of dataset to envelop rainfall DAD curves. Future work suggested would be to use the plotted DAD curves to estimate the probable maximum precipitation for the purpose of hydraulic structure designs.

Keywords: areal rainfall; depth-area-duration; DAD; extreme rainstorm event; geographic information system; GIS; isohyets; Kriging; north-east monsoon; NEM; Sungai Sarawak basin; SSB; Thiessen polygon; tropical rainfall measuring mission; TRMM.

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