



## **Simulation of Flow Characteristics in the Junction of Laishe River and Neishe River in Southern Taiwan Using the Flow-3D Software**

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In 2009, Typhoon Morakot hit Taiwan, intensive rainfall led to multi-area of landslides in Laishe River and Neishe River watershed (Total landslide area about 340 ha), bringing tons of sediment into the rivers. The bed level of the rivers rose rapidly. Seriously topography changed impacted the flow condition and the ability of channel sediment transport in Laishe River and Neishe River. This study takes the junction of Laishe River and Neishe River as research subject and utilizes numerical simulation software to discuss the flow characteristics in the junction as well as nearby reach at the circumstance of bed level changed. Our research utilizes Digital Elevation Model (DEM) to analyze the geomorphologic factors in the watershed by ArcGIS software. Moreover, we use numerical simulation software (HEC-HMS and FLOW-3D) to analyze the hydrology of the catchment and the flow condition in the channel. We set the boundary flood discharge with 100 years return period in 24 hours duration.

The three-dimensional numerical simulation results show that the flow condition emerges more turbulent in the junction due to the fluid interaction between Laishe River and Neishe River, causing flow characteristics more complex. Through vertical velocity and turbulence parameter analysis, we could estimate the erosion area in the meandering zone. According to the analysis results above, we can realize the downstream flow characteristics effected by the interaction of Laishe River and Neishe River, which could be the basic emplacement reference of the bank protective works in the future.