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**Landslides, Stream Sediment Yields, and Shoreline**  
**Changes of Yilan County, 1951-2015**

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## **Landslides, Stream Sediment Yields, and Shoreline Changes of Yilan County, 1951-2015**

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### **ABSTRACT**

Historical aerial photographs, maps and monitoring records are important properties with high values on recording the environment change in time and space. In order to analyze the relationship between landslides, stream sediment yields, and shoreline changes in long-term scale, we chose Yilan County in Taiwan as a study area, and integrated: (1) aerial photographs and base maps (1951, 1969, 1985, 1994, 2001, 2009, 2015); (2) streamflow discharge data (1951-2015); (3) sediment yield data (1951-2015) on the geographic information system platform. Wet/dry line, suspended sediment concentration, and landslide area were used as indicators to trace the spatial-temporal changing trends. Analytical results showed that the total landslide area within Yilan County significantly increased in 1994-2009, but slightly decreased in 2009-2015. Sediment yields were relative low in 1951-1985, but obviously increased after 1985 as typhoon-induced landslides, and the human-induced sediment loading by road construction the downstream of the Lanyang River. Due to these impacts, the shoreline of Yilan County showed spatially unstable extensive trends in 1969-2001. Besides, we also found that the typhoon or heavy rainfall events of 3 to 5-year frequency and large magnitude are the dominant transport process of suspended sediment and shoreline extension. The spatial-temporal correlation in this study would be very helpful information for hazard mitigation and water environment protection.

**KEY WORDS:** landslides; sediment yields; shoreline change; Yilan County