

## **Temporal and spatial responses of river discharge to tectonic and climatic perturbations: Choshui River, Taiwan, and Typhoon Mindulle (2004)**

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**Abstract** One reason that small mountainous rivers discharge disproportionately large quantities of sediment to the coastal ocean is because they are particularly susceptible to short-term episodic events, such as earthquakes and floods. The impact of such events, both temporally and spatially, however, has seldom been monitored. Here we report on the results of probably the most thorough monitoring of a flood ever undertaken: the effect of Typhoon Mindulle (2–4 July 2004) on the character of the water transported by the Choshui River, central western Taiwan, during which 74 million tons of sediment were discharged to the adjacent Taiwan Strait. Results from a series of 113 water samples obtained between 2nd and 4th July from five stations along the middle and lower reaches the river indicate that more than half of the suspended sediment was generated in nearby mountains before the river reached its flood plain. While the concentration of dissolved solids remained more or less constant along the mainstem of the river, the composition changed considerably, reflecting the imprints of local geology. An order-of-magnitude downstream increase in NO<sub>3</sub><sup>-</sup> concentrations reflects the rapid draining of the Tsaoling landslide lake on the Chingshui River, as the 1999 earthquake-generated landslide dam was breached.

**Key words** typhoon; Taiwan; flood; earthquake