

# Fluxes and Isotopic Compositions of Particulate Organic Carbon and Nitrogen from the Tamshui River During Typhoon Flood

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## ABSTRACT

Typhoon flood is recognized as the most important natural event flushing terrestrial material out through mountainous rivers in Taiwan. However, limited data sets are available due to its danger and difficulty in taking typhoon samples. During the invasion of Typhoon Bilis (2000/8/22-24), we conducted a high frequency (about 4 hours) sampling at the Chungyang Bridge at the lower reach of Tanshui River. The concentration of particulate organic carbon (POC) and nitrogen (PN), and their isotopic compositions ( $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$ ) were analyzed. The concentration of particulate matter correlated well with the water discharge rates showing a positive relationship, which can be used to estimate the flux of TSM, POC and PN through water discharge rate records.  $\delta^{15}\text{N}$  value ranges from  $-3\text{‰}$  to  $3\text{‰}$ , however,  $\delta^{13}\text{C}$  ( $-24\text{‰}$ ~ $-25\text{‰}$ ) varies in a narrow range. The degree of variability of isotopic compositions suggests that  $\delta^{15}\text{N}$  is more useful than  $\delta^{13}\text{C}$  to trace the origin of particulate matter in Tanshui River. The flux-weighted  $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$  for particulate matter are  $-24.4\text{‰}$  and  $2.3\text{‰}$ , respectively. Since the particle flux transported during typhoon flood dominated the major fraction of the annual flux, and therefore is representative of the terrestrial endmember, these flux-weighted isotopic numbers could be used to trace the distribution of terrestrial organics in the coastal sediments.

**(Keywords: Typhoon, Tanshui River, stable isotope, nitrogen, organic carbon)**

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