Radiogenic and stable Sr isotopic compositions in rivers from Choshui River during Typhoon Mindulle

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The impact of flood events on the chemical compositions in mountainous rivers is of interest to many researchers, however, only rare occasion fits to study directly. This work aims at understanding of dissolved Sr isotopic variations during a typhoon at a silicate-dominated catchment, characterized by high erosion rate and suspended particles. We present results of hourly monitoring major ions, radiogenic $^{87}Sr/^{86}Sr$, and stable $\delta^{88/86}Sr$ in Choshui River during the Mindulle typhoon in 2004. Our results show K/Cl, Ba/Cl and Ca/Cl correlated well with the total suspended matter and also displayed peaks associated with rainfall events. Elevated Ca/Na and Ca imply potential carbonate weathering at the early stage of the rains when the discharge increased. Meanwhile, the short-term typhoon caused rather large variability in $^{87}Sr/^{86}Sr$ and $\delta^{88/86}Sr$, estimated up to 0.001, and 0.1‰, respectively. Peaks of $^{87}Sr/^{86}Sr$ (up to 0.7156) and lighter $\delta^{88/86}Sr$ (~0.21‰) were detected, relative to the normal period (0.7146±0.0005 and 0.29‰±0.03‰, 2SD, respectively), and these signal remained up to 5 days. Our results indicate that flood-derived discharge through tropical/sub-tropical regions could play a significant role in the Sr continental flux to the ocean.