

# Typhoon-Mediated Organic Carbon Export in the Western Pacific: The Role of Steep Mountainous Rivers

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## Introduction

Steep, mountainous rivers draining recently uplifted lithology on high standing islands within the Inter Tropical Convergence Zone export a disproportionately high amount of sediment given their small area; up to 20% of global export in 3% of the total exorheic land area [1]. Typhoons strongly influence climate in this region, leading to increased sediment discharge, hyperpycnal flow, and efficient deposition of terrestrial particulate organic carbon in marine sediments. If this material escapes methic remineralization – as is expected due to the lack of a continental shelf – typhoon mediated export of plant-derived POC is a net atmospheric CO<sub>2</sub> sink.

## Results and Discussion

Here, we report results from high-resolution (~hours) sampling on the LiWu River, Taiwan, during three sequential typhoons in 2008. Using a combination of bulk carbon isotopes ( $\delta^{13}\text{C}$ ,  $\Delta^{14}\text{C}$ ), vascular plant biomarker concentrations and  $\delta^{13}\text{C}$ , and ramped pyrolysis radiocarbon analysis [2], we describe the source and age of exported POC over a range of discharge conditions. We show that previous results [3] indicating an increase in biospheric POC export during typhoons is an oversimplification; pre-aged soil OC complicates export. We offer an updated view of steep, mountainous rivers as a negative feedback loop to increased atmospheric CO<sub>2</sub>.

[1] Milliman and Syvitski (1992) *J Geol* **100**, 525-544. [2] Galy and Rosenheim (2012) *Geophys Res Lett* **39**. [3] Hilton *et al* (2008) *Nat Geosci* **1**, 759-762.