

## Studies on defining the effect of chemical weathering on river water PCO<sub>2</sub> rates

OTANI, Souya<sup>1\*</sup>

<sup>1</sup>Department of Earth and Planetary Science, Graduate School of Science, The University of Tokyo

Previous studies show that total carbon rates are mainly controlled by only weathering and respiration, and because of this, it is highly possible that river water generally acts as a source of CO<sub>2</sub>. This fact is confirmed by data in a local scale, but when standing on a more nationwide perspective, there is still no compiled data to suggest it.

Based on the works of Kobayashi (1960) and the further datasets of Kobayashi (Harashima et al., 2006) and the data published by the Japan Meteorological Agency, the PCO<sub>2</sub> of the Japanese river water was mapped. Using this, this study worked on determining whether Japanese rivers generally act as a CO<sub>2</sub> taker or not. It will then discuss why, looking at the effects of each presumable parameter, especially focusing on the effects of weathering and respiration.

As a general result, it can be said that (1) Japanese rivers act as a source of CO<sub>2</sub>. (2) Especially, Hokkaido, Kinki area, and the Kyushu area have a high contribution. (3) Urban areas show artificial increase in PCO<sub>2</sub>. (4) In the Japanese river system, soil respiration has a critical effect on PCO<sub>2</sub>, and weathering does not. (5) Therefore, defining the effects of weathering on PCO<sub>2</sub> is still challenging. (6) Areas with steep slopes have a tendency to have lower PCO<sub>2</sub> rates than that of the flat lands. This can be related to the amount soil, which is possibly controlled by the currency of the carrying river.

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