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**An assessment of monsoon variability under elevated atmospheric carbon dioxide levels**

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The timing and strength of the East Asian Monsoon is critical to the daily life of over 1.65 billion people due to life-threatening hazards. Models suggest that the strength and variability of the monsoon may increase simultaneously with an increase in atmospheric CO<sub>2</sub> levels over time, potentially posing larger threats to East Asian populations. Here, we present high-resolution carbon isotope ( $\delta^{13}\text{C}$ ) data on fossil wood from the late Oligocene (28.1 – 23.0 Ma), the last time CO<sub>2</sub> levels were greater than that of present day (> 400 ppmv), in order to quantify the strength and variability of the monsoon during this time. These data show, on average, ~2.5 times more precipitation falling during the summer than winter, suggesting that the overall strength of the monsoon during the late Oligocene is similar to the strength of the monsoon today. The data, however, reveal significant year-to-year variability, suggesting that the seasonal rains might become more variable under elevated levels of atmospheric CO<sub>2</sub>. These data provide the first quantitative proxy assessment of the East Asian Monsoon under elevated carbon dioxide levels relevant to the next 100 years. Instability in the monsoon strength with global warming will have significant implications for flood and landslide hazards within a region that is home to >20% of the world's population.