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Karst river can outgas more CO_2 than non-karst rivers

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Global estimates for the CO_2 flux from river waters to the atmosphere have substantially increased over the last decade. More data from under- represented landscape are needed to refine these estimates. Rivers draining karst landscape are generally oversaturated with CO_2 and thus should outgas CO_2 to the atmosphere, but this has not been well quantified, largely because it has been assumed that karst systems are a sink for atmospheric CO_2 by carbonate weathering.

To qualify and compare the rates of CO_2 emissions from karst fluvial drainages, we deployed floating chambers to estimate instantaneous CO_2 emissions in karst and non-karst catchments in SW of China. CO_2 flux (FCO_2) from karst system can be greater than non-karst, spanning the reported ranges of global FCO_2 obtained by direct measurement. Karst sites FCO_2 is positively-correlated with the product of ū and pCO_2, as with non-karst sites. Pool our data and all available direct measurements from global rivers, we find a single model (using multiple regression and log transformed ū and pCO_2) describes the

FCO_2 from river waters This model has a geographically wider and lithologically more diverse reach, and also includes ingress.
Carbonate lithology covers a significant part of the Earth's surface, thus studying CO_2 degassing from karst fluvial systems is an essential step toward more accurate estimation of global CO_2 evasion from inland waters. By upscaling we can quantify the significance of CO_2 evasions from global karst rivers to the global budget.