

Chemical weathering in the flood plain of the Ganges

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Silicate chemical weathering may provide the critical feedback which has moderates the Earth's climate. However major uncertainties remain over distinction of the silicate weathering flux from the total flux, its sensitivity to climatic, tectonic and lithological controls and where chemical weathering takes place in large river basins [1].

We use new sets of cation, anion, Sr and ⁸⁷Sr/⁸⁶Sr ratios on Ganga floodplain and southern tributaries sampled in monsoons in 2003 and 2005, a three year time series of samples collected at two week intervals downstream on the Ganga and published data on riverine outputs from the Himalayas to calculate the chemical weathering fluxes generated in the Ganga floodplain. The calculated fluxes are within error of those calculated by Lupker et al. [2] from suspended sediments but the values are rather more precise. We discuss the sources of uncertainty.

The carbonate- and silicate-derived fractions of the floodplain chemical weathering are deconvolved by 1) a forward calculation using element/Ca ratios of carbonate and silicate sources based on analyses of leaches and residues of bedload samples and 2) an inverse solution which solves for the element ratios of the carbonate and silicate inputs as well as the carbonate and silicate fluxes. The uncertainties on both methods are large.

[1] Bouchez et al. (2012) *Chemical Geology* **332-333**, 166-184.

[2] Lupker et al., (2012) *Geochim. Cosmochim. Acta.* **84**, 410-432.