Goldschmidt 2021 Abstract
https://doi.org/10.7185/gold2021.7439

Evaluation of the concentration-discharge relationship for the Brahmaputra river

ANUPAM SAMANTA[1] AND RITIMA DAS[1,2]

[1]Indian Institute of Science Education and Research
[2]University of Hyderabad

Presenting Author: anupam.samanta@students.iiserpune.ac.in

The CO_2-mediated weathering of silicate rocks acts as a major sink of atmospheric CO_2 over a geological time-scale. The intensity of these processes in the tropics has mainly been linked to climatic changes, in addition to several other geological factors (lithology, basin slope, tectonics). In this study, we present time-series major ion and Sr concentration data for the Brahmaputra River water at Guwahati, India, at weekly intervals for one year (October 2016 to October 2017). The major ion concentrations dataset show ~2 times change over the studied period, which is relatively lower compared to the discharge variation (~10 times). The seasonal trends of Na-normalized ratios for Ca and Si with water discharge for the Brahmaputra are less pronounced compared to other Himalayan river systems, such as the Ganga and the Salween. The strong seasonal trend of Na*/K for the Brahmaputra, with higher ratios during the non-monsoon period, is attributed to the significant contribution of solutes from the hot springs/alkaline soil. An inverse model was used to estimate the silicate-derived cations and Sr. These results, although show statistically-insignificant seasonal changes, indicating a weaker runoff-weathering linkage for the Brahmaputra river. Spatial comparison of chemical weathering intensity confirms that the Brahmaputra water chemistry at Guwahati is primarily regulated by intense physical weathering around the eastern syntaxis and is less affected by runoff changes.