



Scaling Analysis of the Ganges-Brahmaputra River Discharge

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In this study, we characterize the scaling properties of the Ganges-Brahmaputra river discharge. Using 50 years (1950-2000) of *in situ* measurements of daily discharge at Hardinge (for the Ganges) and Bahadurabad (for the Brahmaputra), we first establish that there is no obvious evidence of the impact of climate change on the discharge of either river; specifically, we find that there is no significant change in the discharge seasonal cycle nor in the variance of their subseasonal fluctuations. Having established weak second order stationarity, we analyse and show that there exists a power-law scaling between 2 days and 60 days for both rivers' normalized discharge fluctuations. The utility of this type of scale-invariance will be illustrated with a temporal disaggregation model, which relates small-scale to large-scale variability (by just a ratio of scales) and enables us to disaggregate 10-day or 35-day discharge estimates from satellite altimetry to the daily scale.