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High Resolution Mid to Late Holocene Paleoclimatic Reconstruction from the Mudflats of Gulf of Kachchh Coast, Western India

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The Indian Summer Monsoon (ISM) governs one of the major climatic phenomenon in southern Asia, particularly the Indian subcontinent. It has been studied relatively sparsely, however, along the western margin of India. The Holocene period is well known for its abrupt short paleoclimatic fluctuations. Here we present a high resolution study on a Middle to Late Holocene mudflat sequence along the coast of the Gulf of Kachchh, western India. Mudflats are known to be robust sediment archives of paleoclimatic change, owing to their being a predominantly depositional environment, which acts as a 'sink' for suspended sediments. The major catchment for the Gulf of Kachchh sediments is the Indus River and adjoining landmasses of the Kachchh and Saurashtra peninsulas. We carried out a multiproxy approach employing sedimentological, mineral magnetic and geochemical parameters to study the fluctuations in the ISM. Our monsoonal proxies show four major phases of alternating high and low flux of sediments to the mudflats on the coast of the Gulf of Kachchh, which can be related to alternating wet and drier phases that span a few decades to a few hundred years in time. The ISM, as evidenced by our data, underwent several sharp fluctuations during the Middle to Late Holocene. The study also has significant implications in understanding human response to climate change in the region during Middle to Late Holocene.