Foreland basin sediment archives: highlighting their use in documenting deformation of the orogenic hinterland and foreland.

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Interrogation of sediment archives allows for documentation of both hinterland and foreland deformation. Examples of their use as an archive of Himalayan foreland deformation include the work of Govin et al. (Geology, 2018) in which determination of the timing of drainage rerouting of the palaeo-Brahmaputra has allowed us to date the timing of surface uplift of the Shillong Plateau, and the work of Najman et al (Tectonics, 2018) in which the presence of the major Paleogene unconformity previously recognised in the Himalayan foreland basin, was shown to extend much further south into the foreland, allowing for a broader range of possible causal mechanisms to be discussed. There are numerous examples of the use of the Himalayan foreland basin sediment record to determine orogenic tectonics, this being a complementary approach to bedrock studies of the orogen. For example, Govin et al. (in review) and Lang et al (GSAB 2016), used detrital mineral lag time studies targeted to the Siwalik Himalayan foreland sediment archive, to demonstrate when the rapid exhumation of the eastern Himalayan syntaxis commenced. Comparison with a similar dataset derived from a more distal sediment archive of the Bengal Fan (Najman et al. GSAB 2019), shows the advantages (as well as disadvantages) in the use of proximal sediment archives.