SEDIMENT TRANSFER UNDER TECTONIC AND CLIMATIC FORCING A NATURAL LABORATORY IN THE CHINESE TIAN SHAN, XINJIANG Malatesta L C¹*, Avouac J-P¹, Pan J², Chevalier M-L², Lamb M P¹, Saint-Carlier D³, Zhang W²





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1. The northern piedmont of the fold-and-thrust belt characterised

kyr T9 terrace. Channel width reflects differential uplift while glacial-sediment-saturated water and then incised them as Chinese Tian Shan in the Xinjiang the flow became undersatured yet powerful (ref. a, b). slope is not affected. The sediment grain size along the reach Uyghur Autonomous Region is a **2.** The Holocene incision of the Anji Hai River is recorded by is steady and indicates the recycling of fan material in modern 18 cut-in-fill terraces that we have sampled for OSL and Ubedload. by a dozen rivers deeply incised in series in carbonate coated pebbles. 5. Location of grain size surveys along the Kuitun River, note Pleistocene alluvial fans. All rivers present a similar facies with **3.** Active anticlines cause a narrowing of river channels. the Dushanzi anticline between survey V and VI. 6. Preliminary analytical solutions for water depth and sedi-200-250 m of entrenchment during the Holocene, equivalent Across the Dushanzi anticline, the Kuitun river has a reduced to 2-2.5 cm/yr incision rates. The likeness of all fluvial profiles ment transport capacity as a function of river geometry conwidth and leaves 9 terraces behind (sampled as well). reflects regional climatic forcing at the end of last glaciation, **4.** Activity of the Dushanzi anticline increases incision rates by strained with field data. During incision phase, river geometry 10% across the structure as documented by the deformed 10 evolves so that its transport capacity increases downstream. when increased river discharge first built up the fans with



Holocene hydrological changes inferred from alluvial stream entrenchment in North Tian Shan (Northwestern China).

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LOCATION OF PEBBLE COUNTS



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Formulas f	or
In 2 nd Mee	tin
Hydraulic 3	Sti



WATER DEPTH (WIDTH, SLOPE)

bedload transport.

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