

Table S3 Exhumation or erosion rates of Cenozoic tectonics and river incision, as well as million to millennial timescale erosion since stabilization of low-relief plateau surfaces.

Target	Exhumation or erosion rate (mm/yr)	Error (mm/yr)	Timing and duration	Reference
Jiali fault (JLF)	1.40	0.200	18-12 Ma	Lee et al., 2003
Eastern Lhasa plateau (ELP)	0.06	0.010	since 10-5 Ma	Zeitler et al., 2014
Nu River (NR)	2.50	0.500	8, 6 Ma	Wang et al., 2018
Zuogong plateau (ZGP)	0.01	0.002	since 18 Ma	This study
Zuogong plateau (ZGP)	0.02	0.002	Millennial timescale	Henck et al., 2011
Lancang fault (LCF)	1.50	0.500	36-34 Ma, 21-18 Ma	This study
Lancang River (LCR)	0.63	0.125	17-14 Ma	Nie et al., 2018
Lancang River (LR)&Zhongdian fault (ZD)	1.00	0.100	~8 Ma; since 1.5 Ma	Replumaz et al., 2020
Markam-Weixi plateaux (MKP-WP)	0.02	0.004	since 35 Ma	This study
Ludian-Zhonghejiang thrust (LZT)	0.45	0.150	50-39 Ma	Cao et al., 2020
Markam fold-and-thrust belt (MKTB)	0.13	0.025	40-30 Ma	This study
Jinsha River (JR)	0.38	0.040	since 15 Ma	Ouimet et al., 2010
Jinsha River tributary (JR Trib.)	0.13	0.025	22-15 Ma	Tian et al., 2014
Suoqu River (SR)-Jinsha River tributary	0.38	0.040	18-15 Ma	Goubert et al., 2019
Litang plateau (LTP)	0.01	0.003	since the late Cretaceous	Tian et al., 2014
Litang plateau (LTP)	0.03	null	since 100 Ma	Zhang et al., 2015
Litang plateau (LTP)	0.04	0.005	Millennial timescale	Fu et al., 2018
Litang fault (LTF)	0.79	0.200	7-5 Ma	Zhang et al., 2015
Yalong River (YR)	0.34	0.020	since 14 Ma	Ouimet et al., 2010
Liqui River (LQR)-Yalong River tributary	0.35	0.070	since 10 Ma	Zhang et al., 2016
Xianshuihe fault (XSF)	1.85	0.200	9-4 Ma	Zhang et al., 2017
Xianshuihe fault (XSF)	0.75	0.100	4 Ma	Zhang et al., 2017
Kangding plateau (KDP)	0.05	0.030	in the Cenozoic	Zhang et al., 2016; Clark et al., 2005; Xu and Kump, 2000
Kangding plateau (KDP)	0.02-0.09	null	Millennial timescale	Ouimet et al., 2009
Dadu River (DR)	0.38	0.125	13-9 Ma	Clark et al., 2005
Dadu River (DR)	0.33	0.040	since 10 Ma	Ouimet et al., 2010
Dadu River tributary (DR Trib.)	0.55	0.250	since 10-12 Ma	Tian et al., 2015

Note: for those cooling rates, we transfer them to exhumation and erosion rates by using reasonable geothermal values of

Reference

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