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Be-10 dating of ice-marginal moraines in the Khumbu Valley, Nepal, Central Himalaya, reveals the response of monsoon-influenced glaciers to Holocene climate change

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Introduction

This file presents the values used to calculate the moraine volume and the catchment-wide denudation rate following the method outlined in Section 5.6 of the main text.

Supplementary Table 1. Calculation of moraine volume

Section	Elevation (m a.s.l.)		Sediment bed thickness (m)	Moraine cross-sectional area ¹ (m ²)
	Bedrock surface	Sediment surface		
A-A ₁	4740	4920	180	113279
B-B ₁	4765	4880	115	121336
C-C ₁	4795	4840	45	100165
D-D ₁	4825	4825	0	67915
			Mean (m ²)	100674
			Length (m)	3200
			Volume (m ³)	287 x 10 ⁶
			Rock volume (m ³)	201 x 10 ⁶
			Volume of frontal ramp ¹ (m ³)	38 x 10 ⁶
			Total moraine complex (m³)	2.38 x 10⁸

¹ The sediment volume beneath the distal slope of the terminal moraine below the terminus, calculated as (length x mean width x 0.5 height x 0.7)

Supplementary Table 2. Calculation of catchment denudation rate

Rock volume of moraine complex	2.38 x 10 ⁸ m ³
Upstream catchment area	36.1 km ²
Estimated mean vertical denudation	6.61 m
Time interval (a)	8000
Assumed rock density	2.2 x 10 ³ kg m ⁻³
Equivalent sediment yield	1.82 x 10 ³ kg km ² a ⁻¹
Mean denudation rate	0.83 mm a⁻¹