TABLE A. NUCLIDE DATA AND SAMPLE DESCRIPTIONS NAHAL YAEL, ISRAEL

Sample*	Sample† elevation (km)	Sample§ type	^{10}Be (10^5 atoms g^{-1})	^{26}Al (10^5 atoms g^{-1})
NY4	0.245	CHA	1.32 ± 0.10	8.96 ± 0.78
NY5	0.220	BR	2.08 ± 0.12	12.27 ± 0.92
N 6	0.258	BR	2.35 ± 0.15	14.39 ± 0.88
NY7	0.283	BR	3.51 ± 0.13	21.58 ± 1.75
N 8A	0.230	COL	1.31 ± 0.13	8.14 ± 0.56
NY8B	0.230	COL	1.28 ± 0.09	7.95 ± 0.45
NY8C	0.230	COL	1.25 ± 0.06	7.86 ± 0.46
NY9	0.230	BR	1.96 ± 0.13	11.21 ± 0.69
NY10	0.258	BR	2.12 ± 0.08	13.09 ± 0.67
NY11	0.280	BR	0.73 ± 0.08	5.61 ± 0.43
NY12A	0.250	COL	1.22 ± 0.12	8.53 ± 0.48
NY12B	0.250	COL	1.17 ± 0.07	7.93 ± 0.52
NY12C	0.250	COL	1.23 ± 0.05	8.06 ± 0.44
NY13	0.304	BR	1.83 ± 0.18	12.93 ± 0.73
NY14	0.275	BR	2.83 ± 0.14	17.87 ± 1.03
NY15B	0.280	COL	2.22 ± 0.12	16.60 ± 1.67
NY15C	0.280	COL	2.10 ± 0.09	12.67 ± 0.90
NY16A	0.270	TER	1.42 ± 0.11	8.77 ± 0.54
NY16B	0.270	TER	1.29 ± 0.09	8.20 ± 0.66
NY16C	0.270	TER	1.65 ± 0.12	9.54 ± 0.56
NY17A	0.256	TER	1.77 ± 0.07	10.25 ± 0.53
NY17B	0.256	TER	1.65 ± 0.06	10.41 ± 0.58
NY17C	0.256	TER	1.55 ± 0.10	N.D.
NY18A	0.262	CHA	1.20 ± 0.07	8.61 ± 0.78
NY18B	0.262	CHA	1.27 ± 0.07	8.18 ± 0.48
NY18C	0.262	CHA	1.42 ± 0.09	8.59 ± 0.54
NY18C	0.262	CHA	1.59 ± 0.07	9.27 ± 0.59
NY19A	0.250	CHA	1.20 ± 0.08	8.32 ± 0.84
NY19B	0.250	CHA	1.31 ± 0.06	7.78 ± 0.47
NY19C	0.250	CHA	1.19 ± 0.07	9.23 ± 0.65
NY20A**	0.245	CHA	1.25 ± 0.05	8.26 ± 0.49
NY20B**	0.245	CHA	1.23 ± 0.05	8.16 ± 0.45
NY20C**	0.245	CHA	1.19 ± 0.05	8.02 ± 0.60

Note: All sample latitudes are ~ N30°, elevation differences throughout basin are small (<150 m) and thus comparisons between sample nuclide abundances are made without elevation or latitude corrections. N.D. = No Data.

* Letters indicate grain-size fraction of sample. A = 250 - 1000 µm, B = 1000 - 4000 µm, and C > 4000 µm.

† For channel, colluvium, and terrace samples, elevation is a weighted average elevation of drainage basin above the sample location (represents possible elevations of sediment source).

§ Sample type: CHA = channel alluvium, BR = bedrock outcrop, COL = hillslope colluvium, TER = terrace sediment.

** Sample location closest to the basin outlet (NY20A-C) used to determine basin-wide rates of sediment generation.

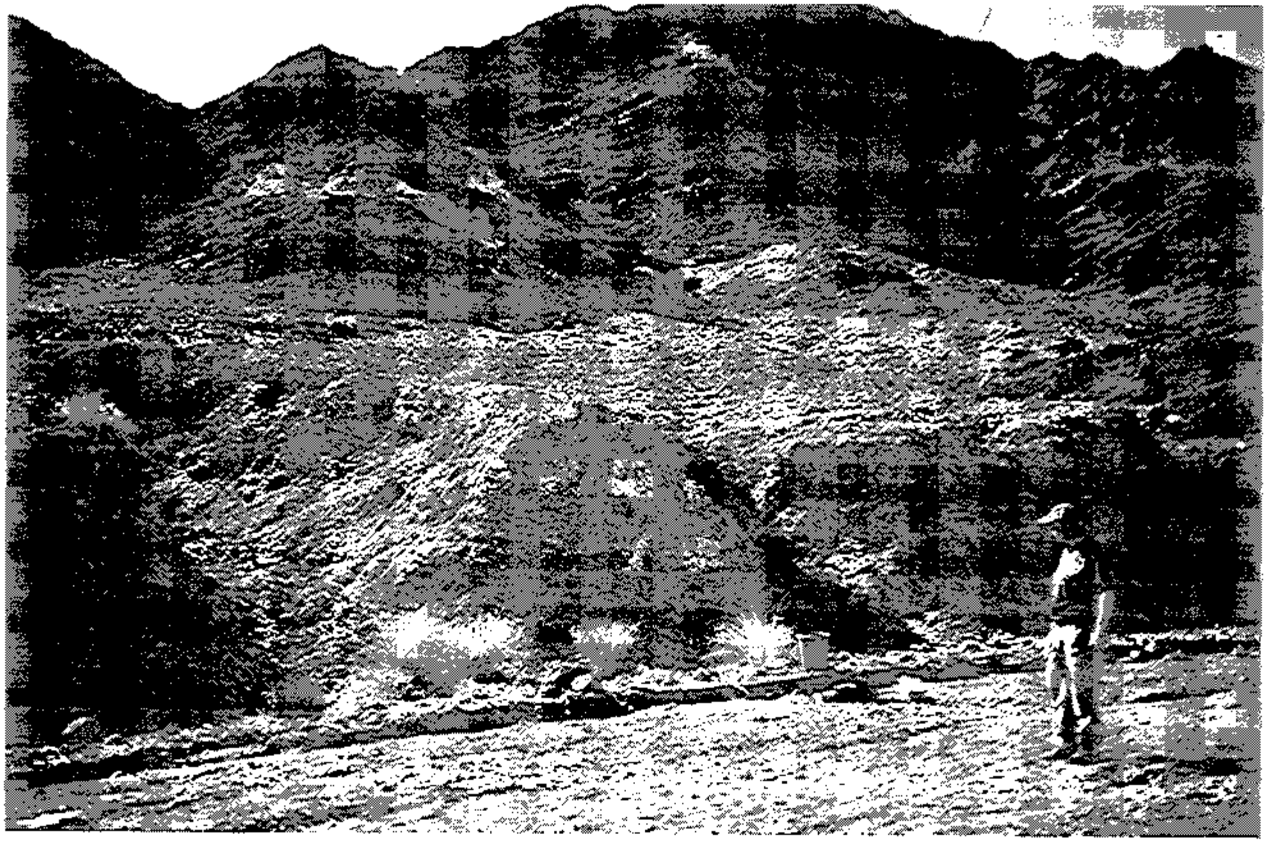

Figure A. Geomorphic features sampled at Nahal Yael. View to south, toward samples NY9 - NY12, NY17, and NY19 (see Fig. 2), shows braided alluvial channel bordered by alluvial terraces and colluvial deposits. Pelitic schist with crosscutting quartz intrusions is in background. Photo was taken downstream of NY19.

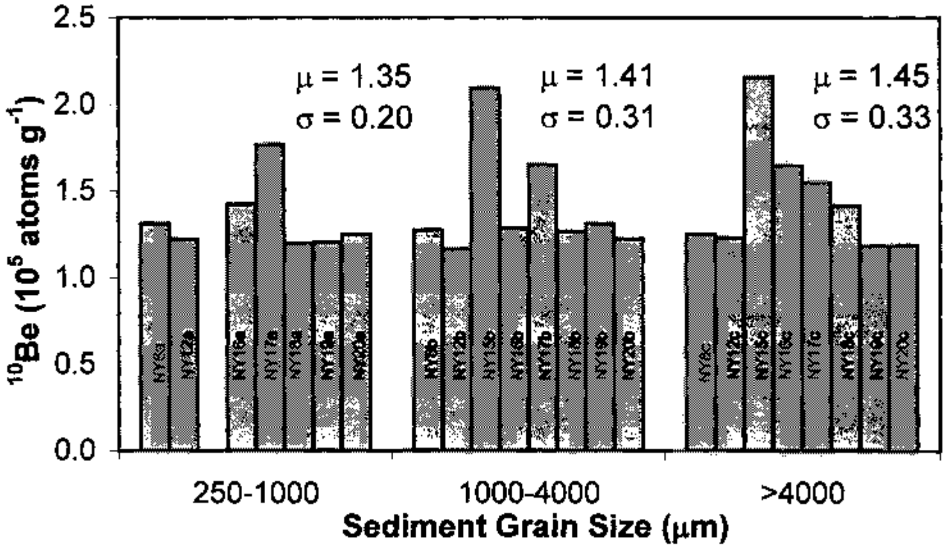

Figure B. Nuclide measurements of grain size fractions from sediment samples indicate that ^{10}Be and ^{26}Al concentrations are independent of sediment grain size implying that large and small particles are produced by similar processes and transported at similar rates. Variance however, increases slightly with grain size due to smaller number of particles analyzed per unit weight of sediment.This finding is consistent with observations that arid region streams transport sediment of many different sizes at similar rates in turbulent flows during infrequent, large, storm events (Lekach et al., 1992; Laronne and Reid, 1993; Reid and Laronne, 1995) and are consistent with cosmogenic measurements elsewhere (Clapp et al., 1997, 1998).

Appendix A.

Sample preparation and analysis

Samples were heated and ultrasonically etched in 6N HCl, then 1% HF and 1% HNO_3 (Kohl and Nishiizumi, 1992) in order to purify quartz. Samples were dissolved in HF with 250 μg of Be carrier; Be and Al were isolated using ion chromatography. $^{10}Be/^{9}Be$ and $^{26}Al/^{27}Al$ ratios were determined by accelerator mass spectrometry at Lawrence Livermore National Laboratory. Measured ratios (μ=5.9 ± 0.48) of ^{26}Al to ^{10}Be (Fig. 3, inset) are consistent with the currently accepted production ratio of ~ 6:1 (Nishiizumi et al., 1989), indicating that our laboratory methods are robust, and that the sediment and bedrock we sampled do not have long-term (>100 ky), complex histories of burial and exhumation. Because the two isotopes are well correlated ($r^2 = 0.95$), we present primarily the ^{10}Be measurements; however, the ^{26}Al measurements are used in all calculations (Table 1 and data repository Table A).

Additional References

Kohl, C.P., and Nishiizumi, K., 1992, Chemical isolation of quartz for measurement of in-situ-produced cosmogenic nuclides: Geochemica et Cosmochemica Acta, v. 56, p. 3583-3587.

Laronne, J., and Reid, I., 1993, Very high rates of bedload sediment transport by ephemeral desert rivers: Nature, v. 366, p. 148-150.

Lekach, J., Schick, A.P., and Schlesinger, A., 1992, Bedload yield and in-channel provenance in a flash flood fluvial system, *in* Billi, P., ed., Dynamics of gravel-bed rivers: Chichester, John Wiley and Sons, p. 537-551.

Reid, I., and Laronne, J., 1995, Bedload sediment transport in an ephemeral stream and a comparison with seasonal and perennial counterparts: Water Resources Research, v. 31, p. 733-781.