Table A. Barbados Sr isotope data.

Sample No.	Miner-alogy	Elev. (m)	Rb ppm	Sr ppm	Sr/Ca (x 10^2)	$\delta^{87}Sr$	$2\sigma_m$
Groundwaters							
W1		210		0.372	0.421	-14.7	1.8
W2		133		0.326	0.455	-13.1	1.1
W2 UF				0.329	0.448	-10.4	1.7
W3		55		0.557	0.822	-14.0	1.7
W4 UF		39		12.1	16.1	- 0.7	1.0
W5		215		0.544	0.630	---	--
W6 UF		5		11.9	11.0	- 3.8	1.4
W7 UF		18		2.99	3.56	-11.1	1.8
C1a		247		0.326	0.358	-14.7	1.6
C1b				----	----	-15.4	1.6
C2a(1)		250		0.246	0.347	-20.4	1.4
C2a(2)				----	----	-19.3	1.7
C2b				----	----	-21.3	2.0
C3 UF		252		0.267	0.336	-16.6	1.4
C4 UF		185		0.450	0.559	-11.7	1.3
C4				0.454	0.561	---	--
C5		185		0.454	0.561	-10.9	1.6
S1 UF		78		0.62	0.806	-12.3	1.4
S2 UF		85		0.611	0.765	-11.4	1.7
S3		108		0.681	0.733	-12.5	1.4
S4a		150		0.476	0.608	-11.8	1.6
S4b				----	----	- 9.0	1.7
S5a UF		45		0.98	1.24	-10.3	1.0
S5b(1) UF				----	----	- 5.2	1.1
S5b(2) UF				----	----	- 5.9	1.7
S6 UF		0		0.96	1.05	-12.8	1.7
Rainwater				0.016	2.58	---	--
Seawater				8.1	1.95	0	
Pleistocene reef limestones							
P2	C	170	0.0090	2100	0.519	- 5.6	2.1
P5	C/A	160		3620	0.904	- 4.4	1.4
P6	C	245		2600	0.657	- 2.0	1.7
P7	C	310		559	0.139	- 4.5	2.8
P8	C	310	0.0030	1480	0.365	- 5.2	1.8
P13	A	20		8030	2.05	--	--
P14	C	150		1230	0.311	- 1.3	1.4
P15	C	150		1540	0.385	--	--
P16a	C	300	0.34	301	0.0751	- 9.9	1.7
P16b	C			----	----	- 7.6	1.4
P20	C	180		2190	0.551	- 5.2	2.7
P22	C	275		692	0.174	- 6.5	1.7
P23	C	238	0.15	613	0.152	- 7.6	1.7
P233a(1)	A	35		8200	2.15	3.5	0.9
P233a(2)	A			----	----	1.5	1.0
P233b	A			----	----	1.1	1.1
P257a	A	35		8400	2.18	- 1.4	0.9
P257b(1)	A			----	----	- 2.6	0.9
P257b(2)	A			----	----	- 4.6	0.9
P1.18a(1)	D	39		890	0.357	- 2.2	0.9
P1.18a(2)	D			----	----	- 2.8	1.2
P86-1a	D	39	0.058	690	0.290	- 5.2	1.3
P86-1b(1)	D			----	----	- 6.4	1.5
P86-1b(2)	D			----	----	- 5.0	0.8
Tertiary pelagic rocks							
T01		25	10.9	1220	0.390	-190.5	1.8
T06		10	15.3	1420	0.439	-198.5	2.0
T723		65	5.7	845	0.221	- 51.8	1.7
T21		178	6.3	1500	0.516	-176.0	1.8

Soils					
SL-1a H_2O	305	0.010	0.171	-18.9	2.8
SL-1a HAc		401	0.108	-10.4	2.4
SL-1b HAc		----	----	-12.0	1.8
SL-1a HCl		417	0.124	----	--
SL-1a CD		170	0.145	----	--
SL-2 H_2O	160	0.009	0.357	- 3.9	1.8
SL-2 HAc		1150	0.413	- 7.2	1.8
SL-2 HCl		1330	0.534	----	--
SL-2 CD		344	0.560	----	--
SL-3 H_2O	150	0.016	0.290	-12.5	3.0
SL-3 HAc		1760	0.135	-10.6	1.7
SL-3 HCl		1540	0.422	----	--
SL-3 CD		1300	0.417	- 7.9	2.1
Soil components					
$(NH_4)_2SO_4$ fertilizer (21-0-0)		0.11		40.3	3.1
GTSP fertilizer (0-46-0)		520		-39.6	1.0
KCl fertilizer (0-0-60)		18		4379.9	1.7
Saharan dust*				770 to 1060	
Lesser Antilles volc. ash **		185 to 214		-870 to -450	
Sea spray salts (estimated value)				0	

Methodology: $\delta^{87}Sr = [((^{87}Sr/^{86}Sr \text{ sample} - {}^{87}Sr/^{86}Sr \text{ seawater}) / {}^{87}Sr/^{86}Sr \text{ seawater})] \times 10^5$. Sr isotope analyses conducted using a Finnigan-MAT 261 (Univ. Texas; UT) and 262 (Cal Tech; CIT) thermal ionization mass spectrometer in static multicollection mode. $2\sigma_m$ = 2 std. dev. of mean. $^{87}Sr/^{86}Sr$ ratios were normalized to $^{86}Sr/^{88}Sr = 0.1194$ using an exponential fractionation law. The following mean (± 1 std. dev.) values were obtained for Sr isotope standards: SRM 987: 0.710248±9 (n=8), UT; 0.710314±7 (n=3), CIT; Seawater: 0.709175±9 (n=14), UT; 0.709234±9 (n=6), CIT. For samples analyzed after 4/93 (see below), an $^{87}Sr/^{86}Sr$ value for SRM 987 (n=6) of 0.710259±12 (= 0.709186 for seawater) was obtained at UT. Reported $\delta^{87}Sr$ values are relative to the value for the seawater standard at the time and place of analysis. Rubidium concentrations determined by isotope dilution (analytical uncertainty < ±3%), Sr and Ca concentrations determined by ICP-AES (< ±3%). Corrections to measured $\delta^{87}Sr$ values for the in situ decay of ^{87}Rb range from 0.6-2.8 δ-units for Tertiary rocks, and are less than 0.01 for Pleistocene rocks. a,b after sample numbers refer to complete analytical replicates; (1), (2) after sample numbers refer to analyses of the same sample solution. These replicate analyses were used to calculate published mean $\delta^{87}Sr$ and $2\sigma_m$values. $2\sigma_m$ values of < 1.0 are published as 1.0.

Sample information: All groundwater analyses are for 0.22μm filtered samples, except for those noted as UF (unfiltered). Elev.: surface elevation, no corrections for differential uplift were applied to the elevation data; W: well water; S: springwater; C: cave water. Water samples were collected 5/92, except for S6, collected 11/89 by R. Stoessel; S1, S5, and W4 , collected 12/89; and C3, W6, and W7, collected 4/93. Rainwater data are averages for Groves Agricultural Station (Harris, 1971). For Pleistocene limestones: A = aragonite; C = low-Mg calcite; D = dolomite; Pleistocene samples are scleractinian coral boundstones, except for sample P1.18 (foram-algal-coral packstone) and P16 (foram-algal-peloid grainstone), 2.5 N HCl insoluble residues (I.R.) are < 3%. Soil treatments: HAc = 12 hour leach in 1N acetic acid; HCl = 0.5 hour leach in 2.5N HCl; H_2O = 0.5 hour leach in distilled water, Sr concentration for leachate at water:sample ratios of 120-180; CD = complete dissolution using HF, HNO_3 and HCl. Sr concentrations for Tertiary rocks and soil acid-leach samples corrected for I.R. values, which range from 18-84%. Tertiary samples TO1 and TO6 keyed to mapped units in Torrini et al. (1985). Pleistocene reef limestone samples P233 through P86-1 keyed to Banner et al. (1991). Fertilizer samples from Fertilizer Corp. of America, Miami, FL. Seawater data from Quinby-Hunt, M. S. and Turekian, K. K., 1983, Eos, v. 64, p. 130-131. *Saharan dust data source: Biscaye, P. E., Chesselet, R., Prospero, J., 1974, Rb-Sr, $^{87}Sr/^{86}Sr$ isotope system as an index of the provenance of continental dust in the open Atlantic Ocean: Journal

**Lesser Antilles volcanic ash data source: Pushkar, P., Stueber, A. M., Tomblin, J. F., and Julian, G. M., 1973, Strontium isotope ratios in volcanic rocks from St. Vincent and St. Lucia, Lesser Antilles: Journal of Geophysical Research, v. 78, p. 1279-1287.