GSA Data Repository 95-19. Digital image processing measurements of percent porosity, measured from backscattered electron micrographs. The different datasets correspond to the case studies in the manuscript.

CASE STUDY OF ALVEOLI, CENTRAL ARIZONA

	Position		
Alveolus Number	Center	Side	1 cm Distant*
1	50.2	28.7	15.0
2	52.2	14.4	5.0
3	38.3	18.9	5.8
4	62.0	26.4	11.2
5	32.5	4.9	2.2
6	34.9	16.8	8.3
7	35.3	5.0	2.3
8	41.8	7.0	4.3
9	45.0	19.7	8.8
10	40.1	16.6	4.8
11	44.7	30.1	14.0
12	51.8	33.4	8.9
13	54.2	32.8	15.5
14	86.8	46.0	24.0
15	48.5	24.9	10.7
Average	47.9	21.7	9.4
Standard Deviation	13.5	11.6	5.9

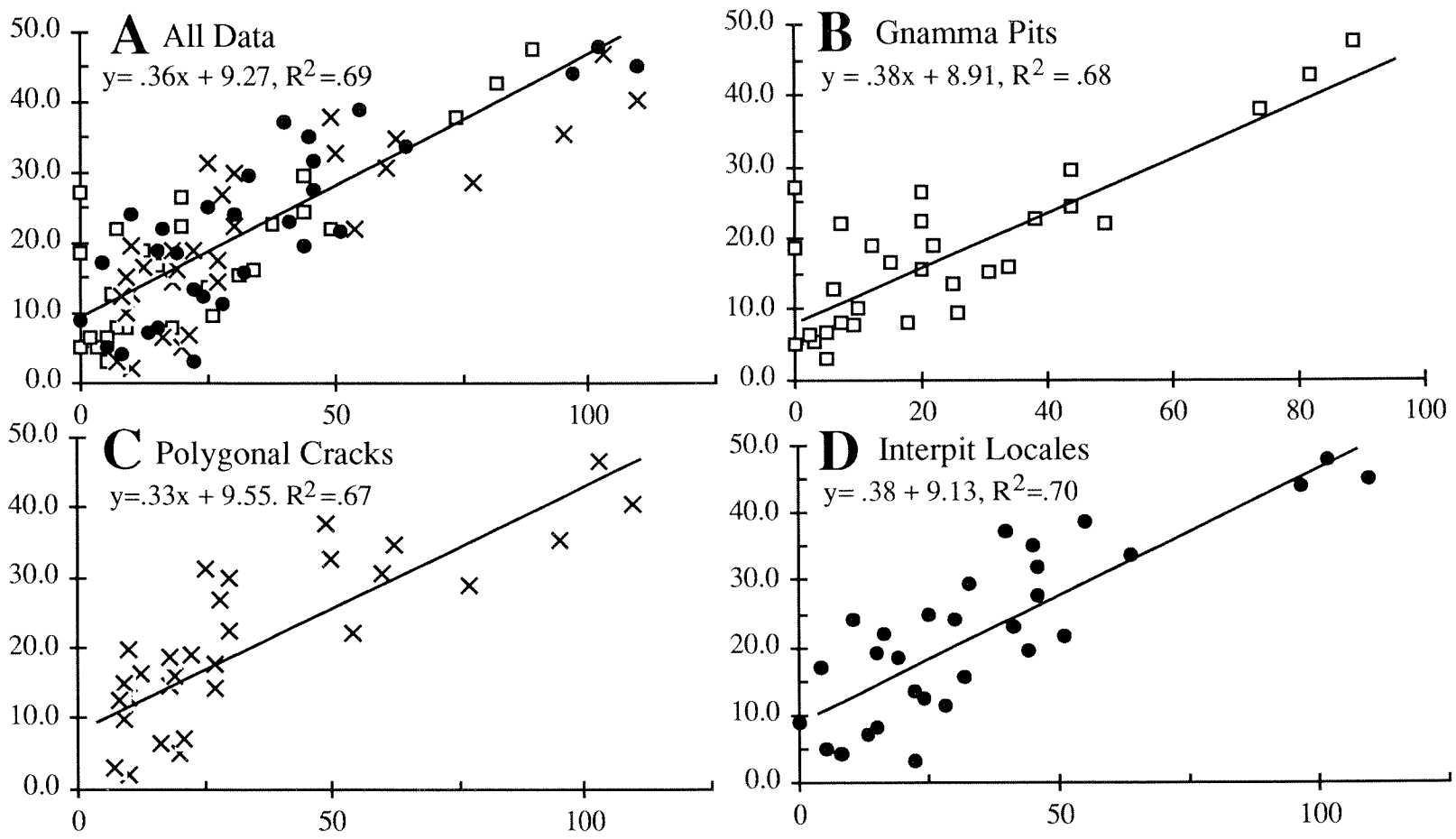
* 1 centimer distant from the edge of the alveolus

CASE STUDY OF POLYGONAL CRACKS & GNAMMA PITS, HAWAII

	Porosity and Silica Glaze Thickness on Different Positions on Boulder					
Sample Number	Gnamma Pit	Silica Glaze**	Polygonal Crack	Silica Glaze**	Interpit Location	Silica Glaze**
1a*	42.7	82	40.3	110	25.0	25
1b	47.6	89	46.7	103	24.2	30
1c	38.0	74	35.4	95	11.3	28
2a	22.8	38	6.4	16	8.0	15
2b	15.4	31	9.8	9	4.2	8
2c	16.0	34	12.7	10	3.1	22
3a	18.9	22	16.4	12	21.5	51
3b	15.7	20	2.1	10	33.8	64
3c	9.5	26	3.0	7	38.7	55
4a	8.0	18	30.0	30	45.2	110
4b	16.7	15	22.3	30	44.0	97
4c	19.0	12	26.7	28	47.9	102
5a	10.1	10	14.5	18	31.8	46
5b	7.7	9	5.1	20	27.6	46
5c	8.0	7	6.9	21	22.9	41
6a	22.3	20	14.3	27	29.4	33
6b	26.4	20	31.4	25	15.7	32
6c	13.7	25	17.6	27	12.3	24
7a	22.1	7	19.0	22	8.9	0
7b	5.0	0	16.0	19	5.1	5
7c	6.6	5	18.8	18	17.0	4
8a	29.4	44	19.5	10	19.5	44
8b	24.5	44	15.0	9	37.3	40
8c	22.0	49	12.4	8	35.0	45
9a	27.0	0	37.9	49	19.0	15
9b	5.2	3	32.7	50	18.6	19
9c	3.0	5	22.0	54	13.5	22
10a	6.4	2	34.7	62	22.0	16
10b	18.5	0	30.5	60	24.0	10
10c	12.7	6	28.7	77	7.1	13
Average	18.0	24	21.0	35	22.5	35.4
Standard Deviation	11.2	24	11.8	29	12.6	28.1

* The designation 'a,b,c' refers to different positions within a given pit, crack or ridge

** Average of glaze thickness, measured in micrometers, on top of corresponding weathering rind.



Weathering under silica glaze, associated with polygonal cracking and gnamma pit development on Maui basalt boulder. Scatter plot and linear regression of porosity in the upper 40 µm of the weathering rind, plotted against silica glaze thickness immediately above the weathering rind.

A. All data
B. Gnamma Pit Locales
C. Polygonal Cracks
D. Interpit Locales

CASE STUDY OF WEATHERING RIND ON VENTIFACTS, BISHOP CREEK, CALIFORNIA

	Porosity at Ventifact Sites		
Boulder Number	V1	V2	V3
1	18.2	8.0	9.7
2	68.4	35.2	37.9
3	30.7	15.3	12.4
4	42.1	22.7	18.5
5	54.7	22.6	20.0
6	57.2	27.8	25.3
7	58.6	33.0	29.0
8	64.1	33.7	32.3
9	62.2	34.0	33.4
Average	50.7	25.8	24.3
Standard Deviation	16.9	9.5	9.8

CASE STUDY OF PLAGIOCLASE ON HUALALAI BASALT FLOWS

Lava Flow*		Age*	Elevation	Isohyet**	Mean Annual Temperature	Cross-Section Area (sq. μm)	Porosity
f5c o7		2200-2300	20 m	500 mm	74 °F	Total=139,000	2.40±0.04
	Section 1					24,500	2.31
	Section 2					25,000	2.33
	Section 3					30,500	2.38
	Section 4					22,500	2.42
	Section 5					36,500	2.54
f5d p9.2		2140±100	100 m	500 mm	73 °F	Total=151,000	2.23±0.05
	Section 1					34,000	2.06
	Section 2					26,500	2.22
	Section 3					24,500	2.32
	Section 4					25,500	2.32
	Section 5					40,500	2.22
f5d c8.2		2030±80	500 m	500 mm	69 °F	Total=152,000	1.74±0.04
	Section 1					39,500	1.82
	Section 2					38,000	1.82
	Section 3					22,000	1.71
	Section 4					23,000	1.62
	Section 5					29,500	1.75
f5e b0.7		2670±80	2377 m	500 mm	50 °F	Total=156,000	0.46±0.04
	Section 1					25,000	0.58
	Section 2					29,500	0.53
	Section 3					37,000	0.43
	Section 4					31,500	0.39
	Section 5					33,000	0.38

* From Moore and Clague, 1991
** From Giambelluca et al., 1986