

Supplementary material for "Microstructures in a shear margin: Jarvis Glacier, Alaska"

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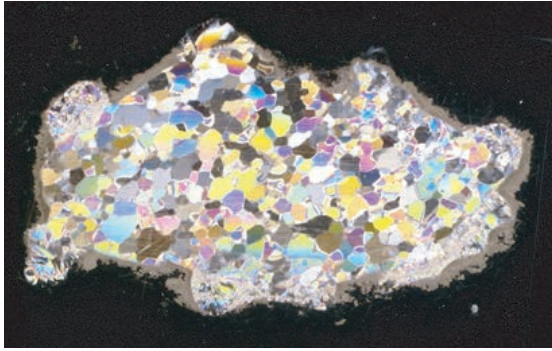
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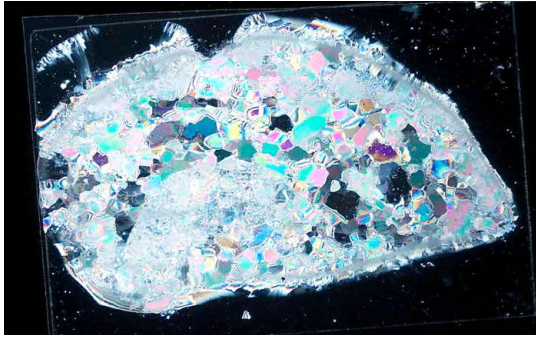
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Figure S1. Thin section photographs (cross polarized light) and line drawings of grain and bubble outlines. On this page, we show images from samples without associated line drawings. On subsequent pages, we show full datasets. Statistics for grain sizes, circularity, and bubble aspect ratio are in Table S2. We do not have thin section images for samples JA122, JA128, JA132, and JE5.

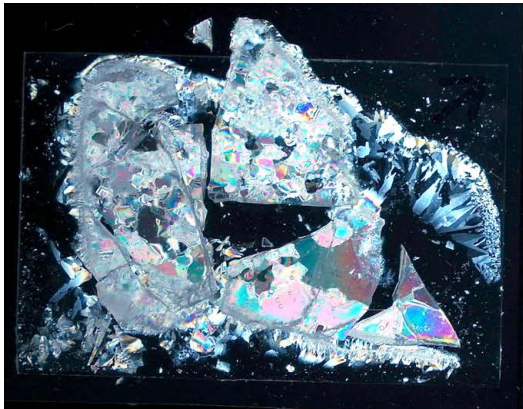
JA2 (0m)



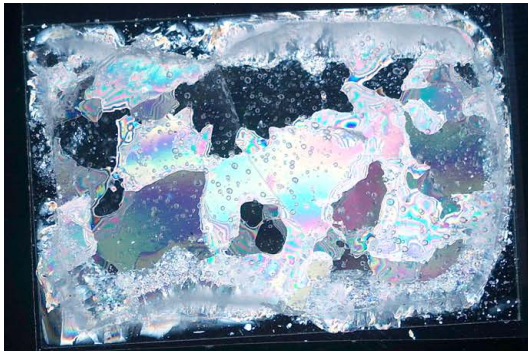
JA22 (12m)



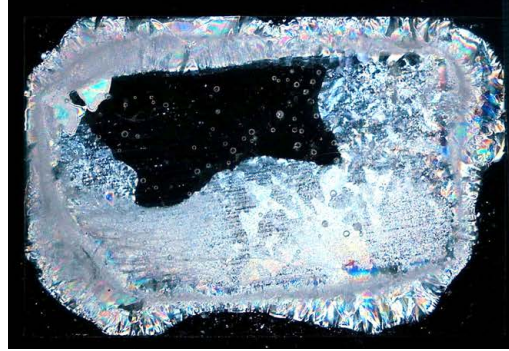
JA48 (30m)



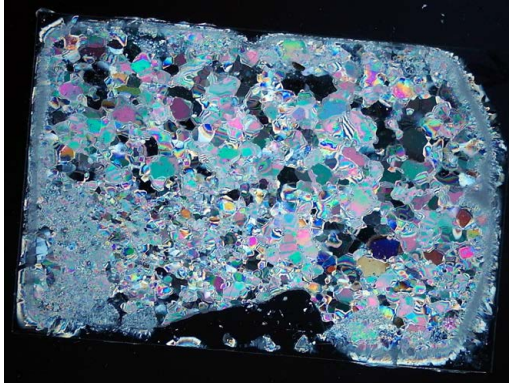
JA72 (45m)



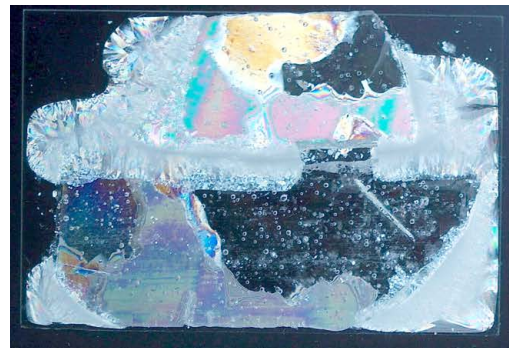
JA80 (50m)



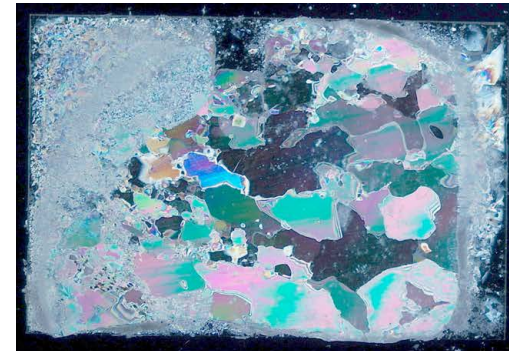
JA87 (55m)



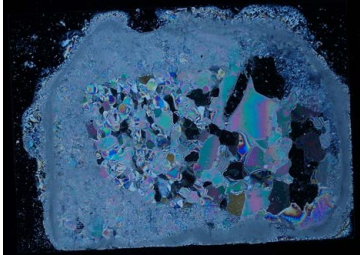
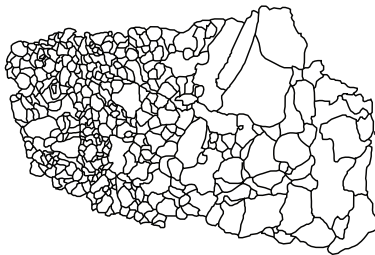
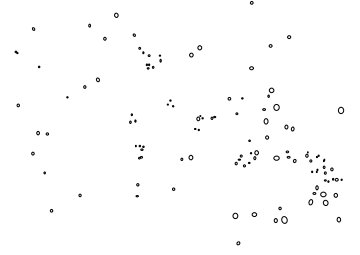

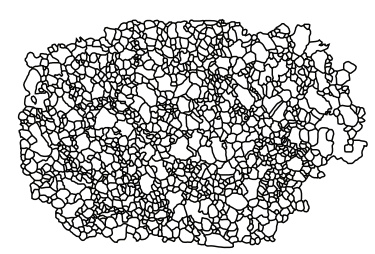

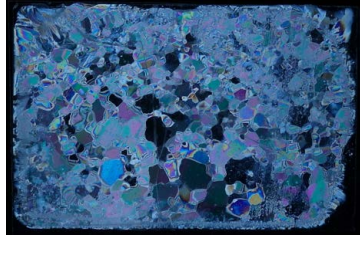
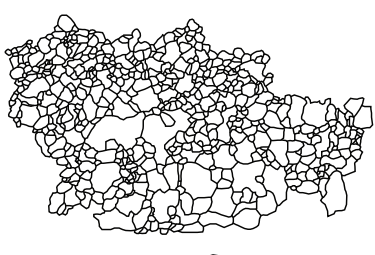
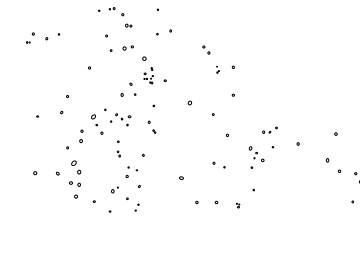
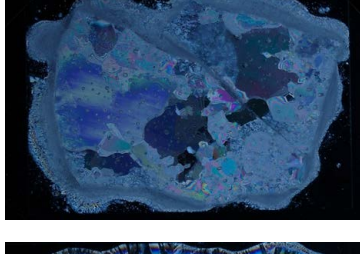


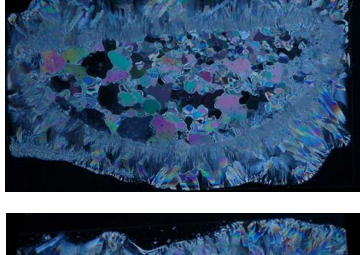
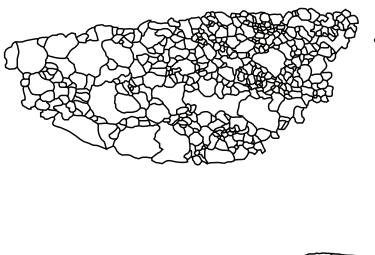
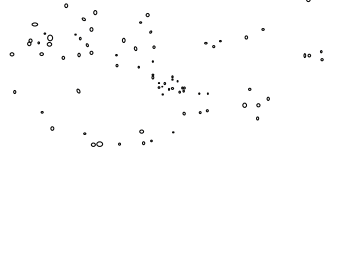
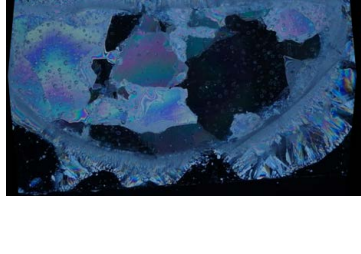


JA112 (69m)



JE7 (4m)

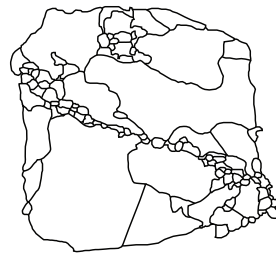
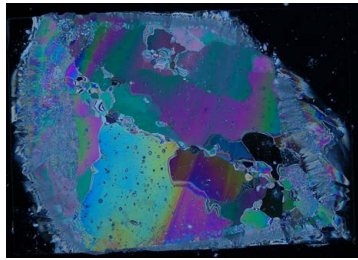


JA

Depth	Sample	Thin Section Photo	Grain outlines	Bubbles
4m	10			
14m	26			
21m	35b			
26m	42			
36m	58-1			
47m	74			

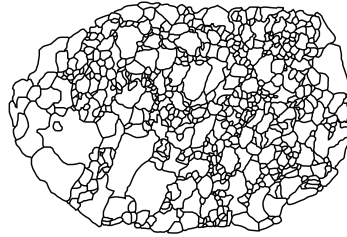
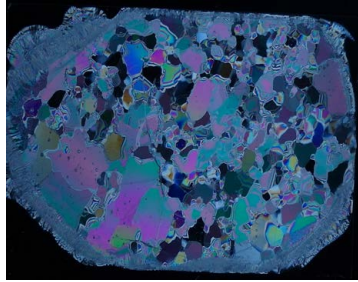
52m

83



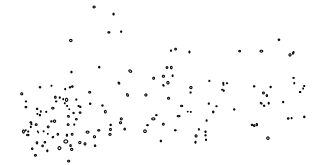
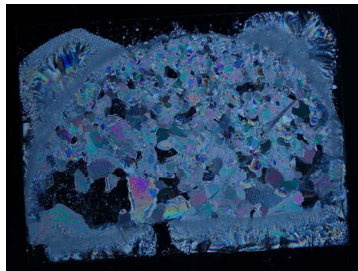
55m

86



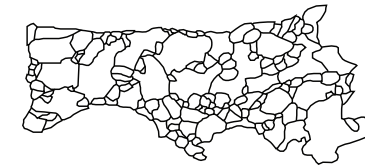
57m

91



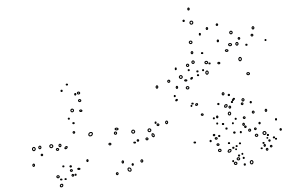
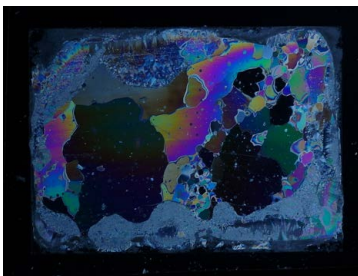
59m

92



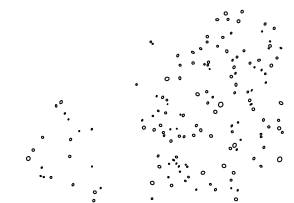
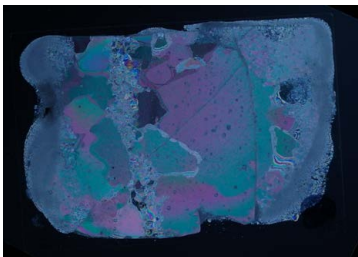
60m

96



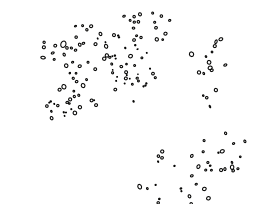
66m

106


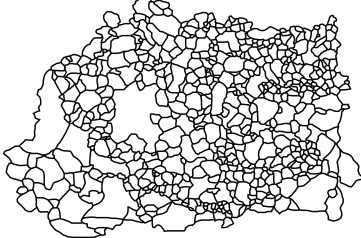

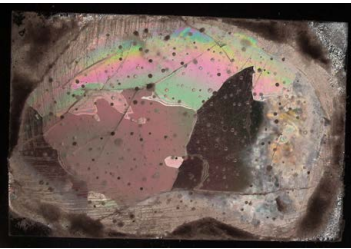
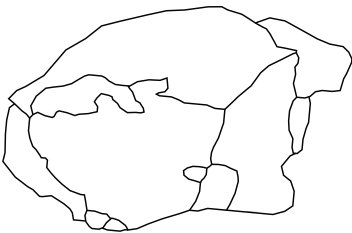
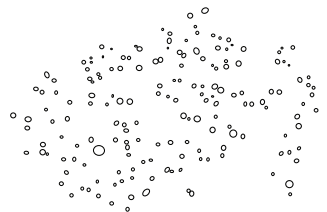
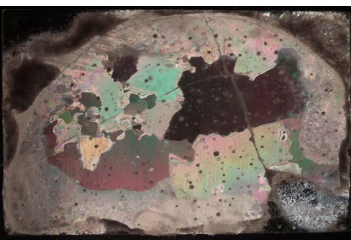

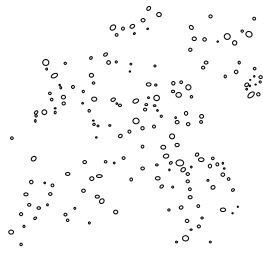

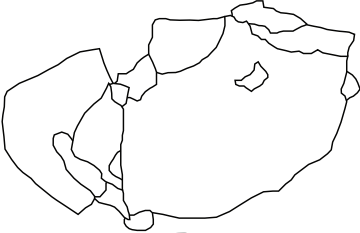
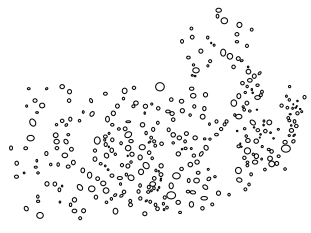
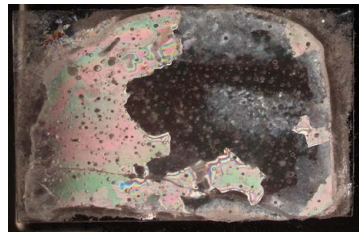
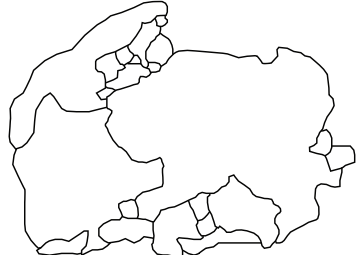
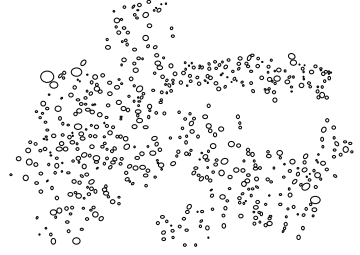
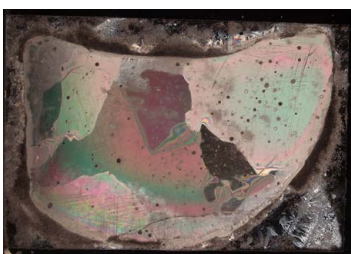
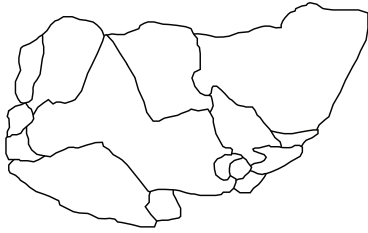
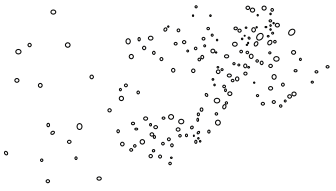


72m

117

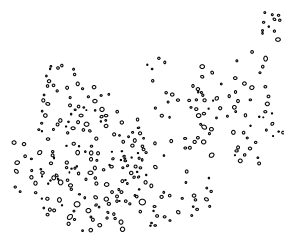
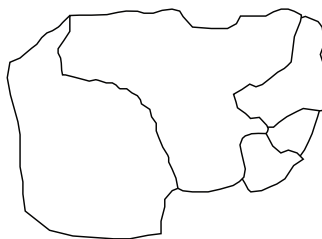
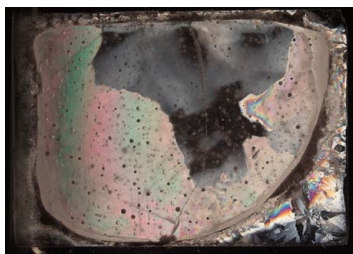


JB

Depth	Sample	Thin Section Photo	Grain outlines	Bubbles
15m	23			
16m	25			
20m	32			
23m	39			
25m	42			
26m	46-1.2			

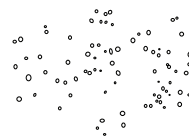
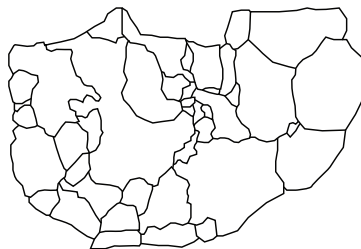
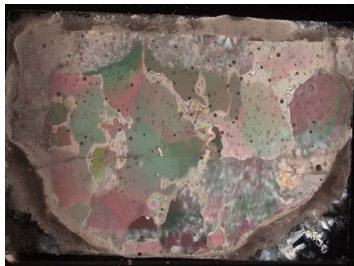
26m

46-1.3



27m

48



JE

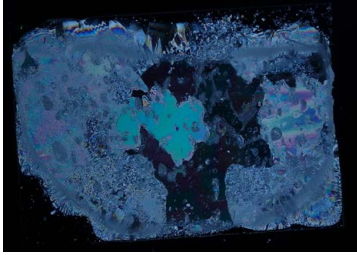
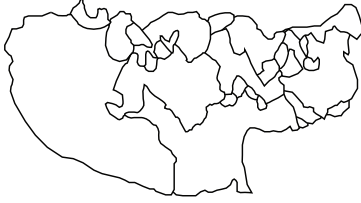
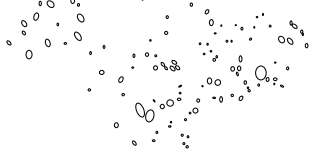
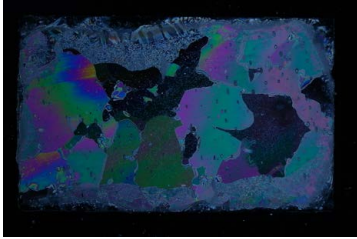
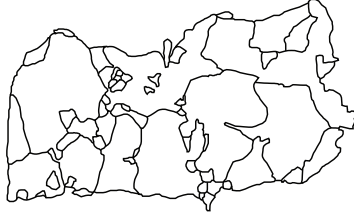

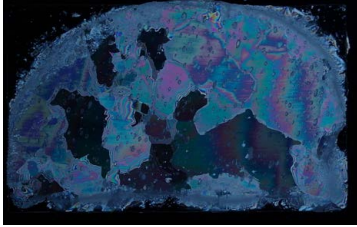
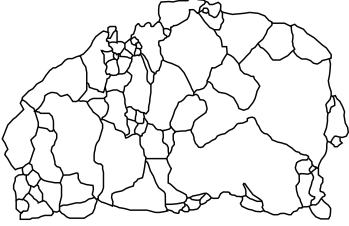

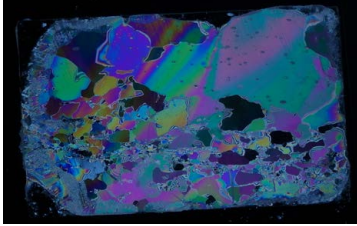


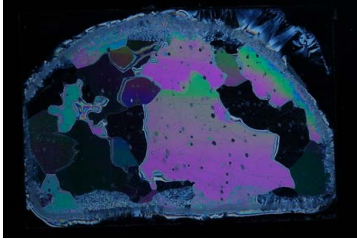
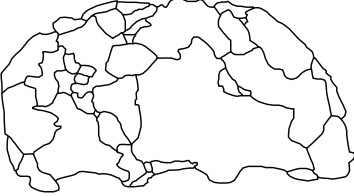
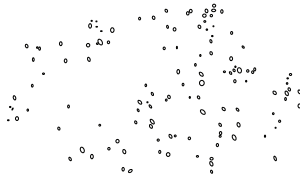
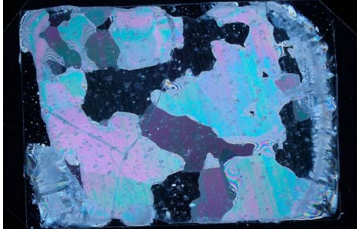


Depth	Sample	Thin Section Photo	Grain outlines	Bubbles
1m	1			
7m	10			
8m	12			
10m	15			
14m	21			
16m	24			

Table S1. Orientation tensor parameters for c-axes

Grain-by-grain data available through the Arctic Data Center, doi:10.18739/A2GB1XH9K

Hole	Sample number	Multiple scans or	Depth (m)	Number of grains	Orientation tensor parameters						Eigenvalue		
					a11	a22	a33	a12	a23	a31	minimum	intermediate	maximum
A	2	No	0	454	0.41	0.21	0.38	0.03	0.03	0.00	0.20	0.39	0.42
A	10 (small grains)	No	5	220	0.24	0.33	0.44	-0.02	-0.11	-0.04	0.20	0.30	0.51
A	10 (large grains)	No	5	13	0.12	0.61	0.27	-0.07	-0.12	0.00	0.11	0.24	0.66
A	22	No	12	309	0.37	0.23	0.40	-0.03	-0.07	0.03	0.20	0.35	0.46
A	35	No	21	180	0.25	0.40	0.35	-0.01	-0.07	-0.02	0.24	0.31	0.46
A	48	No	30	76	0.35	0.25	0.40	0.13	-0.14	-0.02	0.12	0.35	0.53
A	58	No	36	192	0.34	0.35	0.31	-0.11	-0.08	-0.06	0.16	0.38	0.46
A	72	Yes	45	25	0.32	0.48	0.19	0.00	0.05	-0.04	0.17	0.33	0.49
A	74	No	46	32	0.50	0.31	0.19	0.24	0.09	0.17	0.11	0.15	0.73
A	80	Yes	50	14	0.74	0.11	0.15	0.15	-0.01	0.04	0.07	0.15	0.78
A	87	No	55	430	0.19	0.45	0.36	-0.05	-0.13	0.00	0.17	0.28	0.55
A	91	Yes	57	139	0.46	0.28	0.26	0.13	-0.02	0.01	0.20	0.27	0.53
A	96	No	60	86	0.38	0.36	0.26	-0.17	-0.08	0.08	0.20	0.22	0.58
A	106	No	66	31	0.34	0.51	0.15	0.03	0.07	-0.04	0.13	0.35	0.53
A	112	Yes	69	45	0.42	0.28	0.30	0.00	-0.14	-0.02	0.15	0.40	0.45
A	117	Yes	72	22	0.51	0.20	0.29	-0.13	-0.03	0.16	0.14	0.22	0.63
A	122	Yes	74	20	0.22	0.58	0.20	0.17	-0.09	0.03	0.10	0.24	0.66
A	128	Yes	76	26	0.29	0.43	0.28	0.16	0.14	0.04	0.16	0.24	0.60
A	132	Yes	78	19	0.30	0.57	0.13	0.18	0.08	0.07	0.10	0.22	0.68
E	1	Yes	0	75	0.16	0.72	0.12	-0.06	-0.03	0.01	0.11	0.16	0.73
E	5	No	3	49	0.41	0.43	0.15	0.20	0.00	0.03	0.16	0.28	0.56
E	7 (Scan 2)	No	4	71	0.14	0.66	0.21	-0.07	0.10	0.00	0.13	0.19	0.69
E	7 (Scan 3)	No	4	30	0.12	0.64	0.24	-0.04	0.15	-0.03	0.11	0.19	0.69
E	7 combined	Yes	4	101	0.13	0.65	0.22	-0.06	0.11	-0.01	0.12	0.19	0.68
E	10	Yes	6	48	0.64	0.25	0.11	0.00	0.00	-0.04	0.11	0.25	0.64
E	12	Yes	8	45	0.15	0.75	0.11	0.09	-0.03	0.02	0.09	0.16	0.77
E	15 (Scan 3)	No	10	24	0.25	0.63	0.12	-0.22	0.05	-0.05	0.10	0.16	0.74
E	15 (Scan 4)	No	10	137	0.26	0.56	0.18	0.00	-0.05	-0.03	0.16	0.27	0.57
E	15 (Scan 5)	No	10	91	0.28	0.59	0.13	0.16	-0.07	-0.06	0.11	0.22	0.67
E	15 combined	Yes	10	252	0.27	0.58	0.16	0.03	-0.05	-0.04	0.14	0.28	0.59
E	21	No	14	27	0.69	0.19	0.12	0.07	0.03	0.00	0.10	0.20	0.70
E	24	No	16	29	0.56	0.33	0.11	0.23	-0.05	-0.11	0.08	0.19	0.73

Table S2. Summary of optical microstructural measurements
 Original images available through the Arctic Data Center, doi:10.18739/A2BK16Q5T

Sample	Depth	Number of grains	Number of bubbles	Equivalent grain diameter (mm)			Grain Circularity			Bubble aspect ratio		
				Mean	Median	Standard deviation	Mean	Median	Standard deviation	Mean	Median	Standard deviation
JA 10	4.41	405	115	2.05	1.34	3.08	0.60	0.62	0.13	1.37	1.28	0.37
JA 26	14.287	1324	--	1.59	1.22	1.84	0.65	0.67	0.11	--	--	--
JA 35	20.845	591	113	1.69	1.44	2.55	0.65	0.66	0.11	1.23	1.15	0.33
JA 42	25.76	79	147	5.07	2.96	7.28	0.58	0.61	0.14	1.27	1.18	0.29
JA 58-1	36.073	445	79	1.71	1.17	2.38	0.64	0.65	0.11	1.39	1.30	0.31
JA 74	46.82	72	198	5.32	2.29	8.34	0.53	0.55	0.16	1.27	1.17	0.32
JA 83	52.23	106	214	4.78	1.81	8.48	0.61	0.62	0.15	1.35	1.26	0.34
JA 86	54.758	639	129	2.26	1.44	3.16	0.63	0.65	0.12	1.37	1.26	0.43
JA 91	57.195	831	154	1.71	1.21	2.76	0.63	0.65	0.12	1.37	1.25	0.38
JA 92 (a1)	58.61	45	59	5.07	1.95	7.57	0.59	0.58	0.11	1.18	1.12	0.22
JA 92 (a2)	58	152	69	2.20	1.35	2.86	0.61	0.63	0.12	1.16	1.10	0.18
JA 96	60.43	186	156	3.73	1.34	7.73	0.64	0.65	0.11	1.30	1.24	0.26
JA 106	65.63	207	149	3.53	1.16	8.78	0.63	0.64	0.12	1.32	1.23	0.32
JA 117	71.983	19	170	10.98	7.33	13.94	0.51	0.54	0.17	1.24	1.16	0.28
JB 23 ts2	14.792	582	126	1.99	1.48	2.66	0.64	0.66	0.10	1.47	1.33	0.46
JB 25	16.067	11	172	14.04	10.30	15.83	0.53	0.49	0.16	1.19	1.14	0.18
JB 32	19.14	108	177	4.31	1.52	7.86	0.61	0.65	0.13	1.22	1.16	0.21
JB 39	22.55	14	334	8.69	4.74	12.53	0.55	0.54	0.12	1.22	1.16	0.23
JB 42 ts1	23.954	22	560	10.83	4.81	16.57	0.59	0.60	0.15	1.25	1.19	0.23
JB 46/1 ts 1	25.54	15	163	12.23	6.02	14.14	0.56	0.55	0.13	1.19	1.15	0.16
JB 46/1 ts 2	26.15	5	321	22.25	14.75	22.52	0.56	0.59	0.10	1.20	1.14	0.19
JB 48	27.03	43	78	7.91	5.21	9.36	0.58	0.58	0.17	1.19	1.15	0.17
JE 1	0.6	27	105	9.32	4.09	13.36	0.51	0.60	0.17	1.52	1.49	0.41
JE 10	6.87	58	107	7.14	2.66	10.07	0.55	0.54	0.15	1.88	1.83	0.53
JE 12	7.525	72	253	6.46	3.49	9.08	0.59	0.61	0.13	1.88	1.83	0.53
JE 15	9.64	449	77	2.84	1.33	7.52	0.60	0.62	0.14	1.67	1.60	0.48
JE 21	13.61	39	123	8.52	4.43	11.71	0.53	0.53	0.13	1.54	1.50	0.43
JE 24	15.6	43	195	9.11	5.22	11.68	0.54	0.55	0.13	1.65	1.63	0.43