

Supplementary Information for:

The Influence of Magma Density & Edifice Stresses on Silicic Dike Propagation Trajectories at Summer Coon volcano, Colorado, USA

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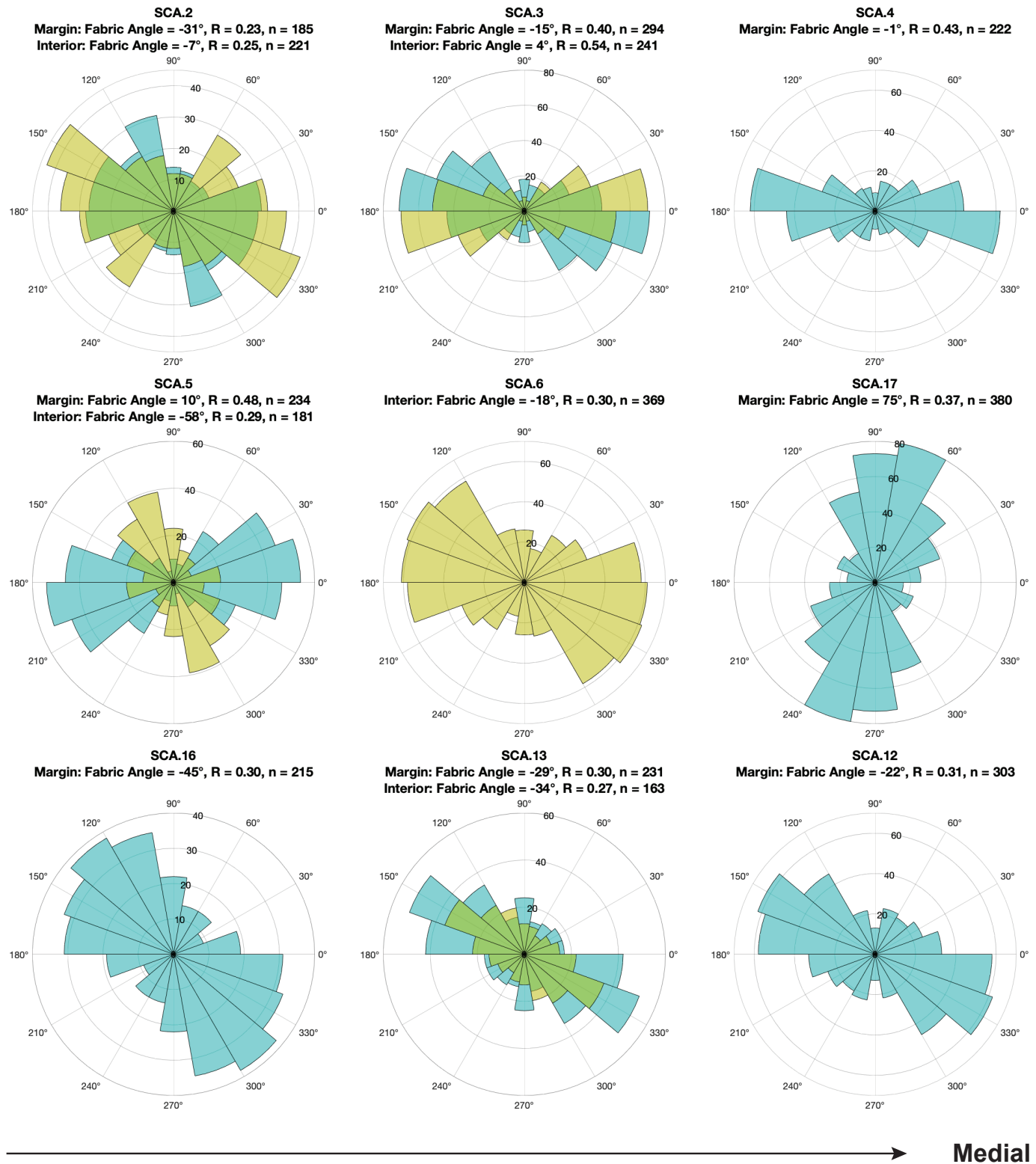
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DIKE A: Proximal & Medial Flow Fabrics

Margin

Interior

Proximal



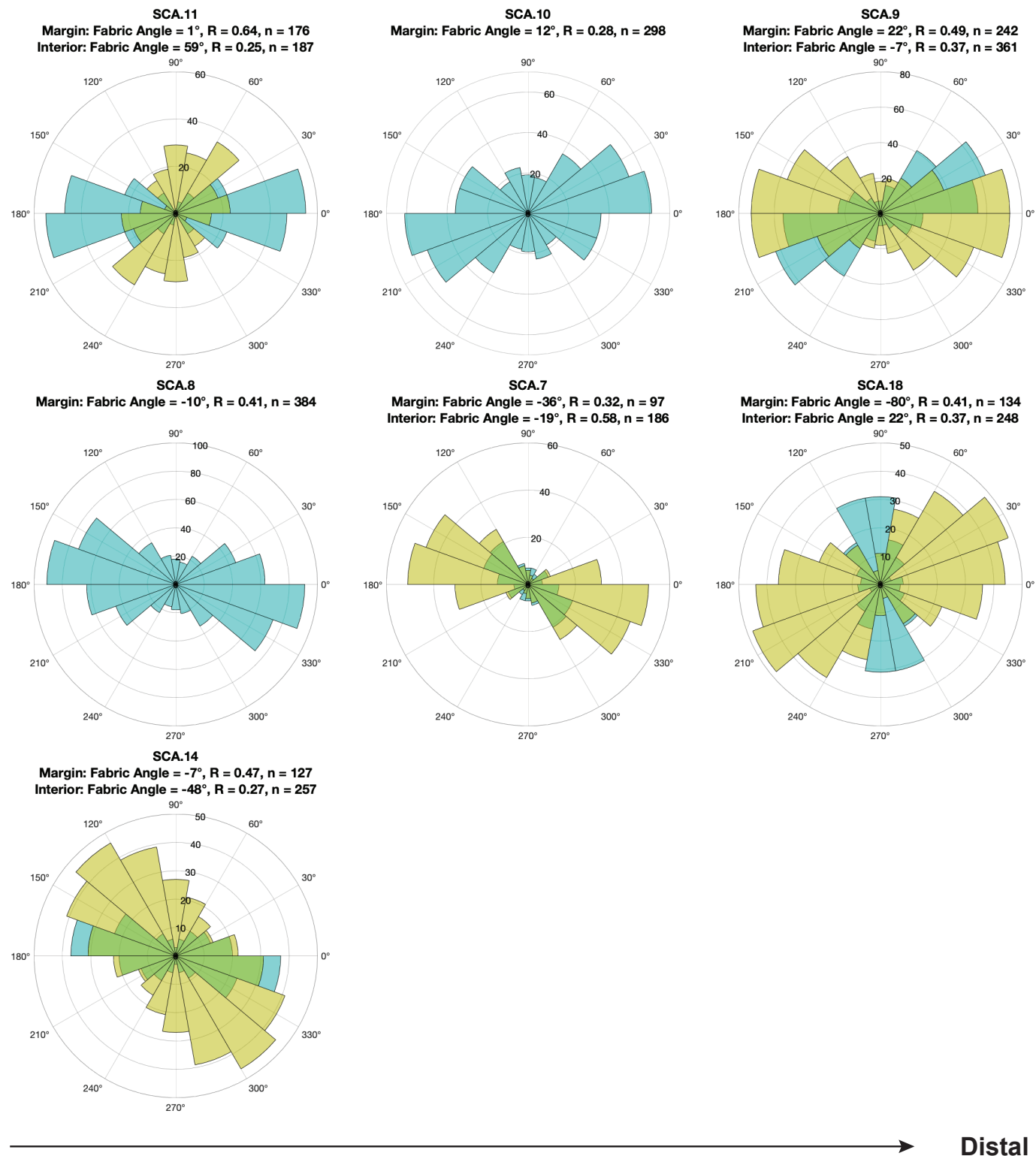
Supplemental Figure 1a: Complete, significant flow fabrics for Dike A proximal and medial segments.

DIKE A: Distal Flow Fabrics

Margin

Interior

Medial



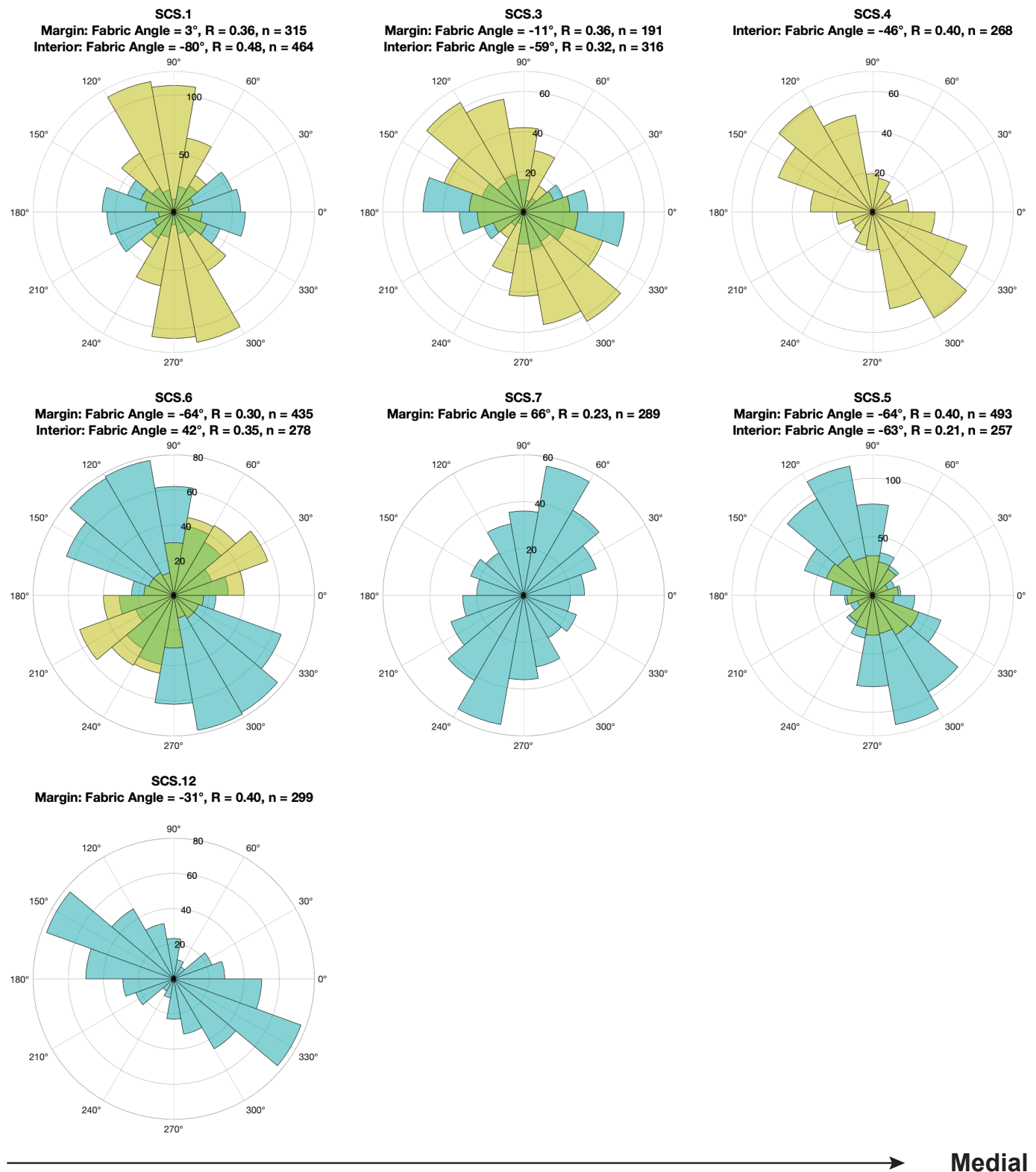
Supplemental Figure 1b: Complete, significant flow fabrics for Dike A distal segments.

DIKE S: Proximal & Medial Flow Fabrics

Margin

Interior

Proximal



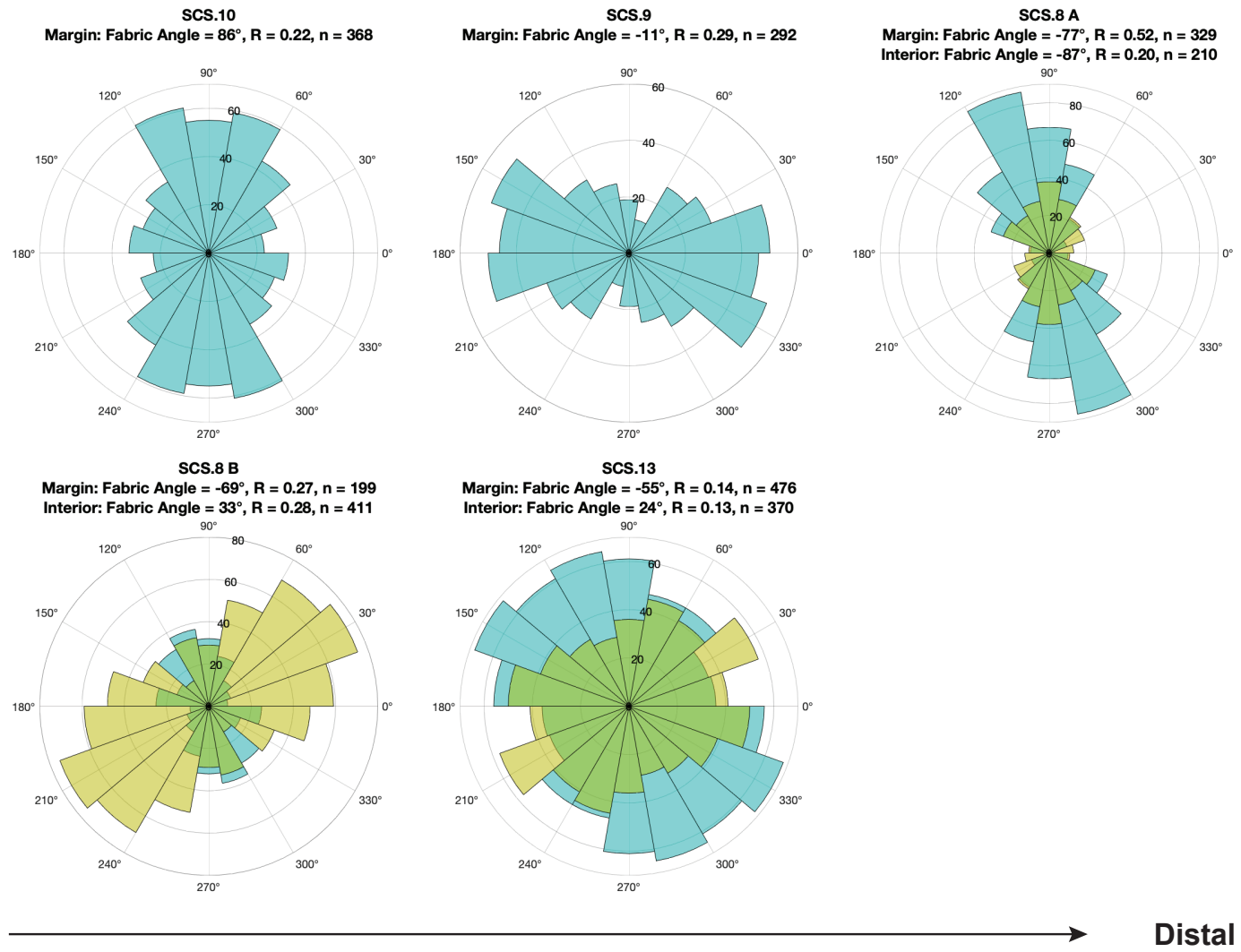
Supplemental Figure 2a: Complete significant flow fabrics for Dike S proximal and medial segments.

DIKE S: Distal Flow Fabrics

Margin

Interior

Medial



Supplemental Figure 2b: Complete flow fabrics for Dike S distal segments. Note that 4 samples (2 interior, 2 margin) were taken at sampling location SCS.8. Location SCS.13 yielded no significant fabric values.

Supplemental Table 1a: Complete data collected for Dike A.

Dike A Measurements	Sample ID#	Latitude	Longitude	Normalized Distance from Dike Start	Moats (1990) Closest Thickness	Dike Thickness (m)	Fabric Angle (°)	Fabric Number of Crystals (n)	Fabric R-value
Margin									
<i>Proximal</i>	SCA.2-1	37.797956	-106.372754	0.10	15.50	29.5	149	185	0.23
	SCA.3-1	37.799985	-106.373623	0.14	15.50	26.9	165	294	0.40
	SCA.4-1	37.803412	-106.375616	0.20	10.10	25.5	179	222	0.43
	SCA.5-1	37.804678	-106.375631	0.22	7.00	21.1	10	234	0.48
<i>Medial</i>	SCA.6-1	37.80957	-106.375185	0.30	13.70	25.8	117	183	0.14
	SCA.17-1	37.812095	-106.376606	0.35	40.50	33.6	75	380	0.37
	SCA.16-1	37.819361	-106.379736	0.49	16.20	56.7	135	215	0.30
	SCA.13-1	37.821353	-106.379808	0.52	44.80	30.2	151	231	0.30
	SCA.12-1	37.821461	-106.380139	0.52	44.80	25.2	158	303	0.31
<i>Distal</i>	SCA.11-1	37.823886	-106.380929	0.57	46.60	31	1	176	0.64
	SCA.10-1	37.825818	-106.381414	0.60	52.70	41.2	12	298	0.28
	SCA.9-1	37.827516	-106.382159	0.63	48.80	43	22	242	0.49
	SCA.8-1	37.828279	-106.382355	0.65	48.80	39	170	384	0.41
	SCA.7-3	37.828757	-106.382669	0.65	48.80	38	144	97	0.32
	SCA.18-1	37.834349	-106.387168	0.77	63.10	42.7	100	134	0.41
	SCA.14-3	37.837524	-106.388849	0.83	50.90	55.2	173	127	0.47
Interior									
<i>Proximal</i>	SCA.2-2	37.797972	-106.37284	0.10			173	221	0.25
	SCA.3-2	37.800004	-106.373667	0.14			4	241	0.54
	SCA.5-2	37.804654	-106.375609	0.22			122	181	0.29
<i>Medial</i>	SCA.6-2	37.809946	-106.375195	0.31			162	369	0.30
	SCA.13-4	37.821191	-106.380001	0.52			146	163	0.27
<i>Distal</i>	SCA.11-2	37.823874	-106.380914	0.57			60	305	0.25
	SCA.9-3	37.827517	-106.382056	0.63			173	361	0.37
	SCA.7-2	37.82876	-106.382634	0.65			161	186	0.58
	SCA.18-2	37.834331	-106.386019	0.76			22	248	0.37
	SCA.14-1	37.837149	-106.389178	0.82			132	257	0.27

Supplemental Table 1b: Complete data collected for Dike A continued.

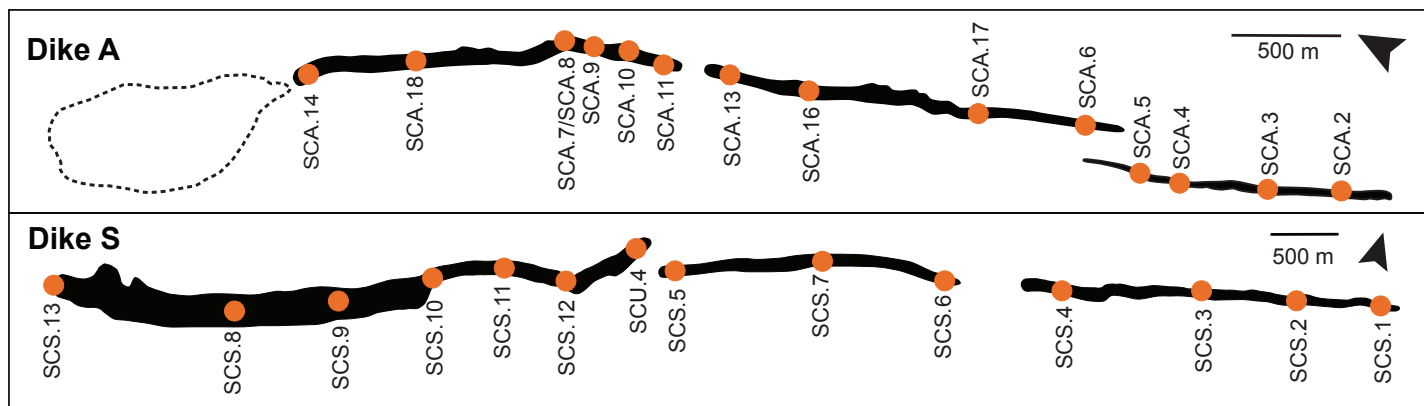
Dike A Measurements	Sample ID#	Mean Fabric Angle (°) (segment)	Mean Fabric <i>R-value</i>	Total Porosity (%)	Error in Porosity (% of total)	Bulk density (kg/m ³)	Solid density (kg/m ³)
Margin		167	0.57				
<i>Proximal</i>	SCA.2-1	171	0.86	7.98	4.59	2401	2609
	SCA.3-1			15.57	3.41	2218	2627
	SCA.4-1			10.35	1.03	2456	2740
	SCA.5-1			4.72	2.84	2524	2650
<i>Medial</i>	SCA.6-1	141	0.52	4.65	1.41	2556	2681
	SCA.17-1			3.24	3.37	2569	2655
	SCA.16-1			0.63	22.21	2591	2608
	SCA.13-1			8.13	1.12	2481	2701
	SCA.12-1			8.70	4.10	2422	2653
<i>Distal</i>	SCA.11-1	175	0.57	9.65	8.42	2422	2673
	SCA.10-1			8.02	2.08	2422	2634
	SCA.9-1			8.64	4.39	2411	2639
	SCA.8-1			2.88	3.04	2538	2613
	SCA.7-3			8.27	2.11	2452	2673
	SCA.18-1			1.48	2.44	2567	2605
	SCA.14-3			1.95	5.61	2557	2608
Interior		164	0.53				
<i>Proximal</i>	SCA.2-2	163	0.60	3.23	1.47	2540	2625
	SCA.3-2			6.53	0.74	2483	2657
	SCA.5-2			10.37	2.68	2352	2624
<i>Medial</i>	SCA.6-2	154	0.96	9.99	1.04	2527	2807
	SCA.13-4			12.70	0.66	2351	2693
<i>Distal</i>	SCA.11-2	176	0.38	6.27	1.13	2544	2714
	SCA.9-3			3.83	1.00	2575	2677
	SCA.7-2			4.07	5.10	2578	2688
	SCA.18-2			6.53	1.58	2510	2686
	SCA.14-1			7.02	1.19	2473	2660

Supplemental Table 2a: Complete data collected for Dike S.

Dike S Measurements	Sample ID#	Latitude	Longitude	Normalized Distance from Dike Start	Moats (1990) Closest Thickness	Dike Thickness (m)	Fabric Angle (°)	Fabric Number of Crystals (n)	Fabric <i>R</i> -value
<i>Proximal Margin</i>									
	SCS.1-3	37.773951	-106.393448	0.02	5.90	11.5	3	315	0.36
	SCS.2-3	37.773694	-106.395086	0.06	6.10	13.2	156	315	0.12
	SCS.3-1	37.77325	-106.397729	0.14	6.90	12	169	191	0.36
	SCS.4-4	37.772457	-106.401822	0.25	13.10	16	100	234	0.11
<i>Medial Margin</i>	SCS.6-1	37.772163	-106.406315	0.38	15.20	20.1	116	435	0.30
	SCS.7-1	37.771444	-106.408990	0.45	29.00	29.7	66	289	0.23
	SCS.5-3	37.770709	-106.412432	0.55	35.10	21.7	116	493	0.40
	SCU.4-1	37.770981	-106.413609	0.58	35.1	32.2	19	256	0.05
	SCS.12-1	37.770006	-106.415214	0.63	36.60	38	149	299	0.40
<i>Distal Margin</i>	SCS.11-1	37.769586	-106.416396	0.66	38.10	34.6	62	356	0.14
	SCS.10-1	37.76923	-106.418824	0.73	33.50	74.5	86	368	0.22
	SCS.9-1	37.767769	-106.421092	0.80	82.30	81	169	292	0.29
	SCS.8-6	37.767255	-106.423222	0.86	109.70	72.2	103	329	0.52
	SCS.8-7	37.767121	-106.423395	0.87	109.70	72.2	111	199	0.27
	SCS.13-1	37.76668	-106.427176	0.97	114.30	52.4	125	476	0.14
<i>Proximal Interior</i>									
	SCS.1-1	37.773958	-106.393405	0.02			100	464	0.48
	SCS.2-1	37.773665	-106.395114	0.07			168	305	0.13
	SCS.3-2	37.773269	-106.397731	0.14			121	316	0.32
	SCS.4-2	37.772448	-106.401704	0.25			134	268	0.40
<i>Medial Interior</i>	SCS.6-3	37.772061	-106.406376	0.38			42	371	0.35
	SCS.5-2	37.770652	-106.412297	0.55			117	257	0.21
	SCS.12-3	37.769821	-106.415184	0.63			130	307	0.07
<i>Distal Interior</i>	SCS.10-3	37.769042	-106.41876	0.73			-	-	-
	SCS.8-3	37.767396	-106.423379	0.87			93	210	0.20
	SCS.8-1	37.767566	-106.423469	0.87			33	411	0.28
	SCS.13-2	37.766783	-106.428225	1.00			24	370	0.13

Supplemental Table 2b: Complete data collected for Dike S continued.

Dike S Measurements	Sample ID#	Mean Fabric Angle (°) (segment)	Mean Fabric <i>R-value</i>	Total Porosity (%)	Error in Porosity (% of total)	Bulk density (kg/m ³)	Solid density (kg/m ³)
<i>Proximal Margin</i>							
	SCS.1-3	176	0.97	4.64	4.45	2475	2595
	SCS.2-3			4.09	1.28	2488	2594
	SCS.3-1			4.75	0.82	2482	2606
	SCS.4-4			8.46	0.66	2431	2656
<i>Medial Margin</i>	SCS.6-1	115	0.56	7.28	0.47	2418	2608
	SCS.7-1			7.81	0.72	2387	2589
	SCS.5-3			7.82	1.25	2393	2596
	SCU.4-1			2.33	0.58	2520	2580
	SCS.12-1			5.69	1.20	2427	2574
<i>Distal Margin</i>	SCS.11-1	109	0.54	6.91	2.77	2416	2595
	SCS.10-1			9.05	3.55	2354	2588
	SCS.9-1			3.99	2.83	2472	2575
	SCS.8-6			2.39	4.17	2522	2584
	SCS.8-7			-			
	SCS.13-1			4.38	2.42	2457	2569
<i>Proximal Interior</i>							
	SCS.1-1	118	0.88	5.70	1.07	2432	2579
	SCS.2-1			4.85	0.50	2508	2636
	SCS.3-2			8.16	0.45	2444	2662
	SCS.4-2			8.71	1.69	2433	2665
<i>Medial Interior</i>	SCS.6-3	80	0.26	9.24	0.95	2428	2676
	SCS.5-2			6.11	0.96	2506	2669
	SCS.12-3			11.36	1.00	2298	2592
<i>Distal Interior</i>	SCS.10-3	63	0.50	9.34	2.92	2267	2500
	SCS.8-3			1.08	7.36	2517	2544
	SCS.8-1			4.41	1.72	2463	2577
	SCS.13-2			7.16	1.65	2395	2580



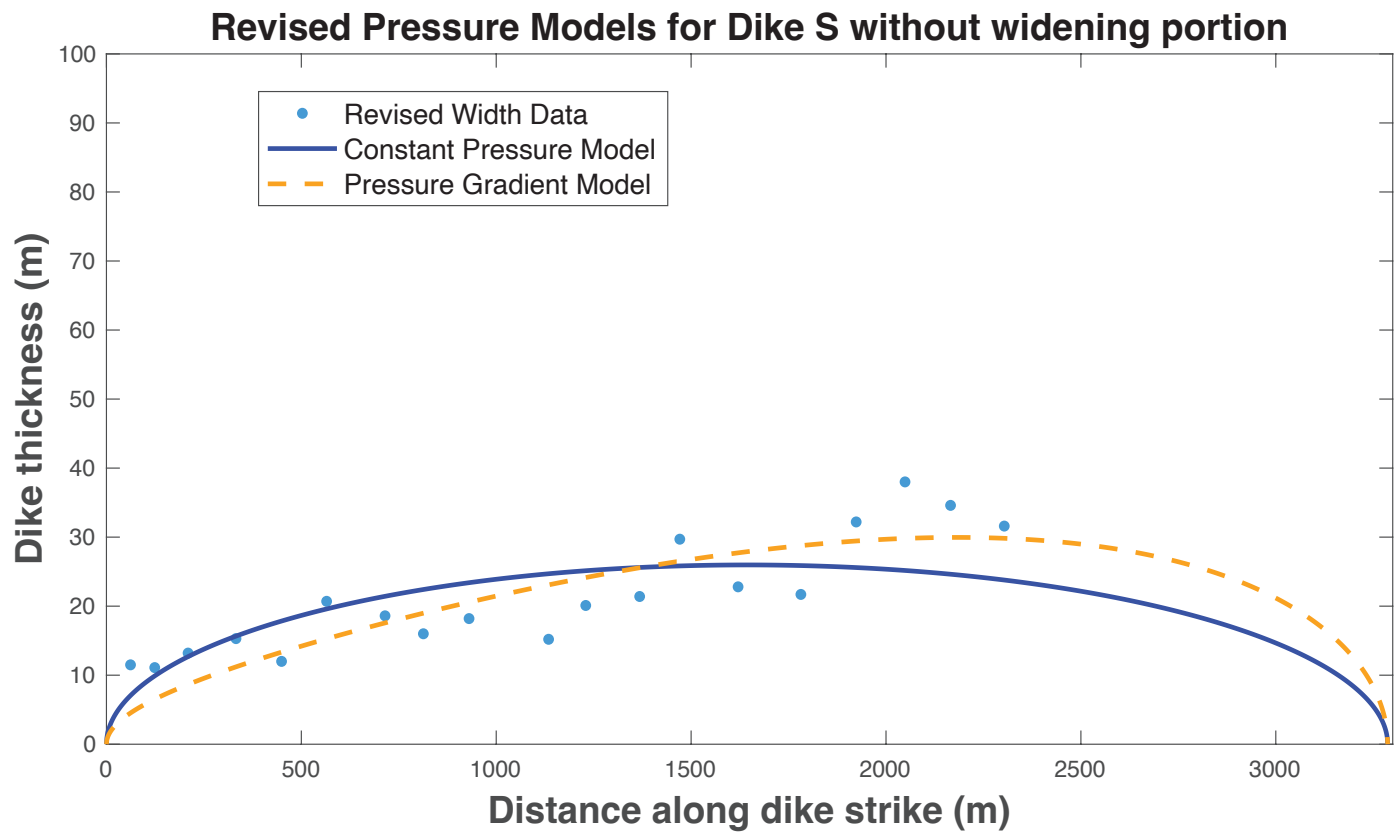
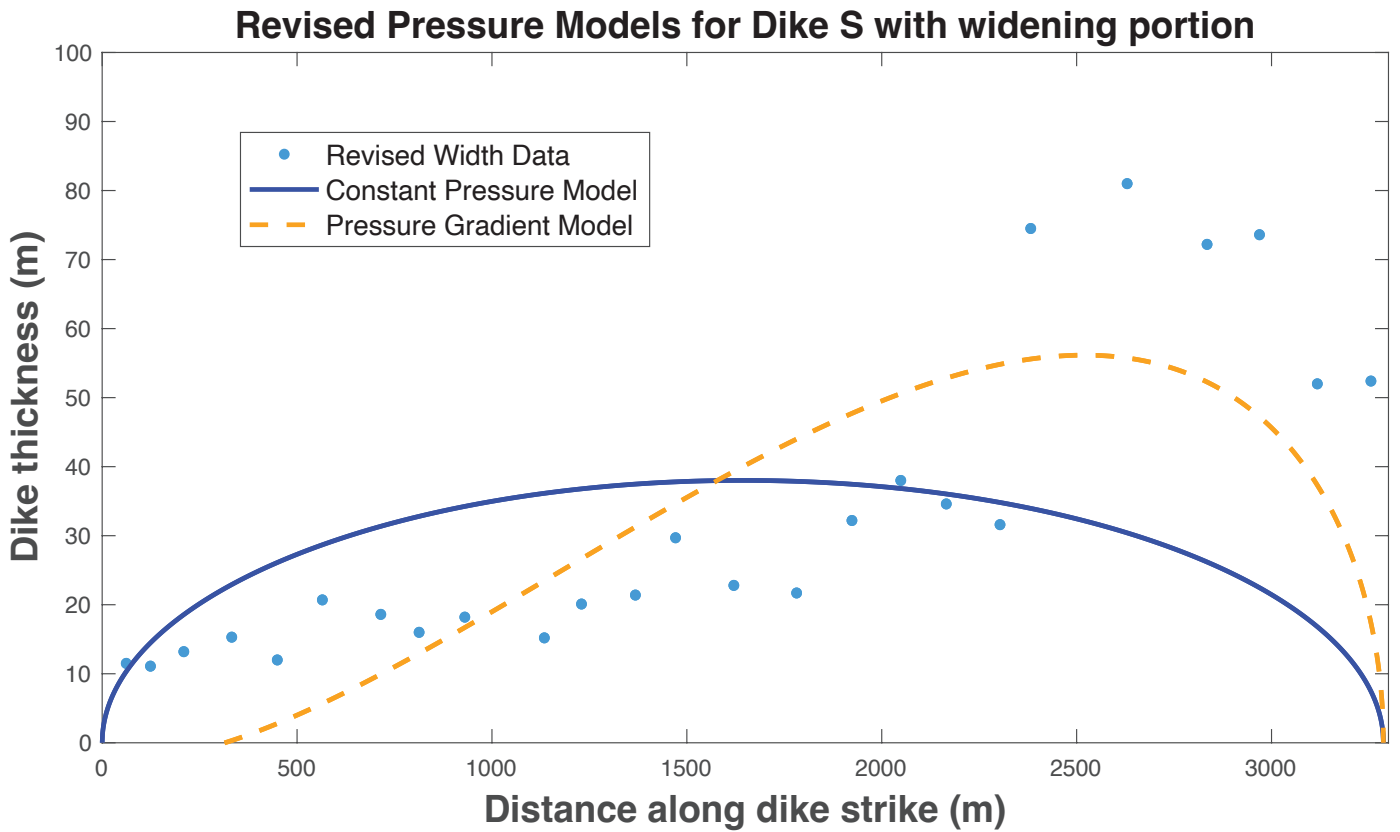
Supplemental Figure 3: Sampling site locations presented in this paper for Dikes A and S with sample identification numbers labeled. Refer to Supplemental Material Tables 1 and 2 for GPS coordinates and data collected at each location

Supplemental Table 3: Complete normalized bulk rock geochemistry results for Dike A and Dike S.**Dike A Normalized Bulk Rock Geochemistry:**

	<i>Margin-Proximal</i>	<i>Interior-Proximal</i>	<i>Margin-Medial</i>	<i>Distal-Margin</i>	<i>Distal-Interior</i>	<i>Distal-Interior</i>
	SCA.2-3	SCA.2-2	SCA.7-3	SCA.14-3	SCA.14-1	SCA.14-2
SiO₂	64.9599534	65.608471	65.4620684	64.6954706	64.9962759	65.3459694
TiO₂	0.62025079	0.63559041	0.629349	0.64092712	0.64783024	0.63361999
Al₂O₃	15.7214152	15.6669518	15.4180116	15.8184925	15.5317779	15.4926239
FeO*	3.95325532	4.4284326	4.70619765	4.5613003	4.6618748	4.49757223
MnO	0.05918125	0.04966028	0.05429916	0.08234239	0.05762752	0.06364441
MgO	1.98623656	2.24266644	1.89188669	2.32635068	2.21437035	2.28070919
CaO	4.86742876	3.63651938	3.75865532	4.10622881	3.65778335	3.74382468
Na₂O	3.61374963	3.78978303	3.87630519	3.99620146	3.92684635	3.99487214
K₂O	3.97360256	3.69138022	3.94293014	3.52260548	4.04623927	3.69117431
P₂O₅	0.24492653	0.25054478	0.26029691	0.25008066	0.25937431	0.25598974
Total	100	100	100	100	100	100

Dike S Normalized Bulk Rock Geochemistry:

	<i>Interior-Proximal</i>	<i>Margin-Proximal</i>	<i>Margin-Medial</i>	<i>Margin-Distal</i>	<i>Interior-Distal</i>
	SCS.2-1	SCS.3-4	SCU.4-3	SCS.8-1	SCS.8-3
SiO₂	69.6563282	68.2932905	69.489836	69.4930524	70.337053
TiO₂	0.36395706	0.3586587	0.36130736	0.39010213	0.33431916
Al₂O₃	15.863594	16.4631773	15.5926549	15.434306	15.3246017
FeO*	2.41875637	2.71627865	2.78766012	3.17305738	2.68717847
MnO	0.03515721	0.05861597	0.04988763	0.02637933	0.03051917
MgO	0.56990642	0.73278446	0.67524667	0.64918354	0.56485324
CaO	2.24956228	2.5411462	2.42443788	2.27049076	2.16954544
Na₂O	4.20598132	4.47925281	4.3148262	4.22820708	4.29574769
K₂O	4.4799479	4.18849367	4.13865737	4.18217007	4.12674901
P₂O₅	0.15680916	0.16830171	0.16548582	0.15305134	0.12943311
Total	100	100	100	100	100



Supplemental Figure 4: Pressure models calculated for Dike S including and excluding the distal widening portion. After Poland et al. (2008) revised for updated Google Earth and ground measurements of dike widths.