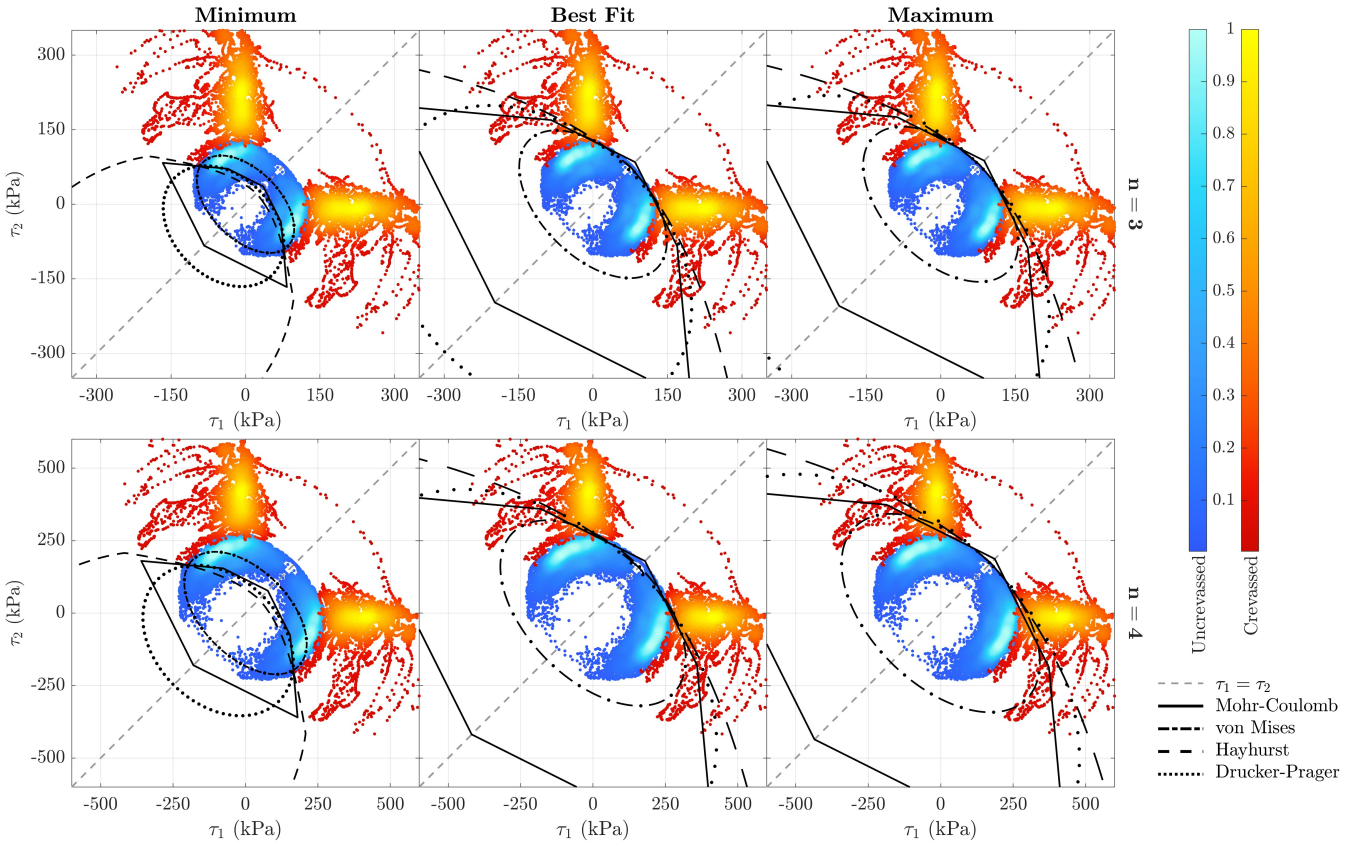

Fig. 1. The four yield criteria discussed in the main text plotted with the minimum, best fit, and maximum values of cohesion or tensile strength presented in the main text for both $n = 3$ and $n = 4$. Both the Drucker-Prager and Mohr-Coulomb criteria are plotted with $\mu = 0.4$

Table 1. Tested values of internal friction (μ) and minimum, best fit, and maximum values cohesion (c_0) used to fit the Mohr-Coulomb criterion.

		Mohr-Coulomb				
μ	n	c_0 (kPa)	σ_t (kPa)	σ_c (kPa)	% Uncrev.	% Crev.
0	3	83	166	166	54.7	0
0	3	127	254	254	99.6	5.7
0	3	132	264	264	100	6.5
0.1	3	82	149.1	182.2	44.4	0
0.1	3	139	252.7	308.9	99.5	5.5
0.1	3	145	263.6	322.2	100	6.4
0.2	3	79	131.7	197.5	31.6	0
0.2	3	152	253.3	380	99.6	6.3
0.2	3	158	263.3	395	100	7.4
0.3	3	77	118.5	220	23.9	0
0.3	3	164	252.3	468.6	99.4	7.3
0.3	3	171	263.1	488.6	100	8.6
0.4	3	75	107.1	250	19.4	0
0.4	3	178	254.3	593.3	99.6	8.1
0.4	3	184	262.9	613.3	100	8.8
0.5	3	73	97.3	292	16.3	0
0.5	3	190	253.3	760	99.6	8.2
0.5	3	198	264	792	100	9.4
0.6	3	70	87.5	350	13.8	0
0.6	3	204	255	1020	99.7	8.6
0.6	3	211	263.8	1055	100	9.5
0.7	3	68	80	453.3	12.6	0
0.7	3	217	255.3	1446.7	99.7	8.8
0.7	3	224	263.5	1493.3	100	9.6
0	4	177	354	354	48.2	0
0	4	269	538	538	99	6.5
0	4	280	560	560	100	9.2
0.1	4	176	320	391.1	37.4	0
0.1	4	295	536.4	655.6	98.8	7.7
0.1	4	308	560	684.4	100	11.1
0.2	4	171	285	427.5	24.8	0
0.2	4	324	540	810	99.2	9.3
0.2	4	336	560	840	100	12.1
0.3	4	167	256.9	477.1	19.2	0
0.3	4	352	541.5	1005.7	99.2	9.9
0.3	4	364	560	1040	100	12.5
0.4	4	162	231.4	540	15.3	0
0.4	4	377	538.6	1256.7	99.1	9.8
0.4	4	392	560	1306.7	100	12.7
0.5	4	156	208	624	12.9	0
0.5	4	406	541.3	1624	99.2	10.4
0.5	4	420	560	1680	100	13.3
0.6	4	151	188.8	755	11.9	0
0.6	4	430	537.5	2150	99	10.4
0.6	4	448	560	2240	100	13.5
0.7	4	146	171.8	973.3	11	0
0.7	4	461	542.4	3073.3	99.3	11.2
0.7	4	476	560	3173.3	100	13.6

Table 2. Tested values of internal friction (μ) and minimum, best fit, and maximum values cohesion (c_0) used to fit the Drucker-Prager criterion.

		Drucker-Prager				
μ	n	c_0 (kPa)	σ_t (kPa)	σ_c (kPa)	% Uncrev.	% Crev.
0	3	73	146	146	49.4	0
0	3	112	224	224	98.9	5.1
0	3	117	234	234	100	6.7
0.1	3	69	133.5	153.3	38.2	0
0.1	3	120	232.3	266.7	98.3	5.5
0.1	3	129	249.7	286.7	100	7.8
0.2	3	66	123.8	165	31	0
0.2	3	130	243.8	325	98.2	6.9
0.2	3	141	264.4	352.5	100	11.2
0.3	3	62	112.7	177.1	24.4	0
0.3	3	139	252.7	397.1	97.9	8.5
0.3	3	152	276.4	434.3	100	13.5
0.4	3	58	102.4	193.3	19.8	0
0.4	3	149	262.9	496.7	97.9	9.3
0.4	3	164	289.4	546.7	100	15.4
0.5	3	54	92.6	216	16.3	0
0.5	3	161	276	644	98.3	10.7
0.5	3	176	301.7	704	100	17.1
0.6	3	50	83.3	250	14.1	0
0.6	3	167	278.3	835	97.4	10.2
0.6	3	187	311.7	935	100	18
0	4	158	316	316	43.3	0
0	4	240	480	480	98.3	6.9
0	4	257	514	514	100	12.8
0.1	4	150	290.3	333.3	32.5	0
0.1	4	259	501.3	575.6	97.8	9
0.1	4	282	545.8	626.7	100	17.2
0.2	4	141	264.4	352.5	24.1	0
0.2	4	276	517.5	690	96.6	10.2
0.2	4	308	577.5	770	100	20
0.3	4	133	241.8	380	19.3	0
0.3	4	294	534.5	840	95.6	11.1
0.3	4	334	607.3	954.3	100	22.1
0.4	4	124	218.8	413.3	15.4	0
0.4	4	320	564.7	1066.7	96.8	14.8
0.4	4	359	633.5	1196.7	100	23.4
0.5	4	116	198.9	464	13.5	0
0.5	4	337	577.7	1348	95.6	15
0.5	4	385	660	1540	100	24.5
0.6	4	107	178.3	535	12.1	0
0.6	4	359	598.3	1795	95.8	16.2
0.6	4	411	685	2055	100	25.7

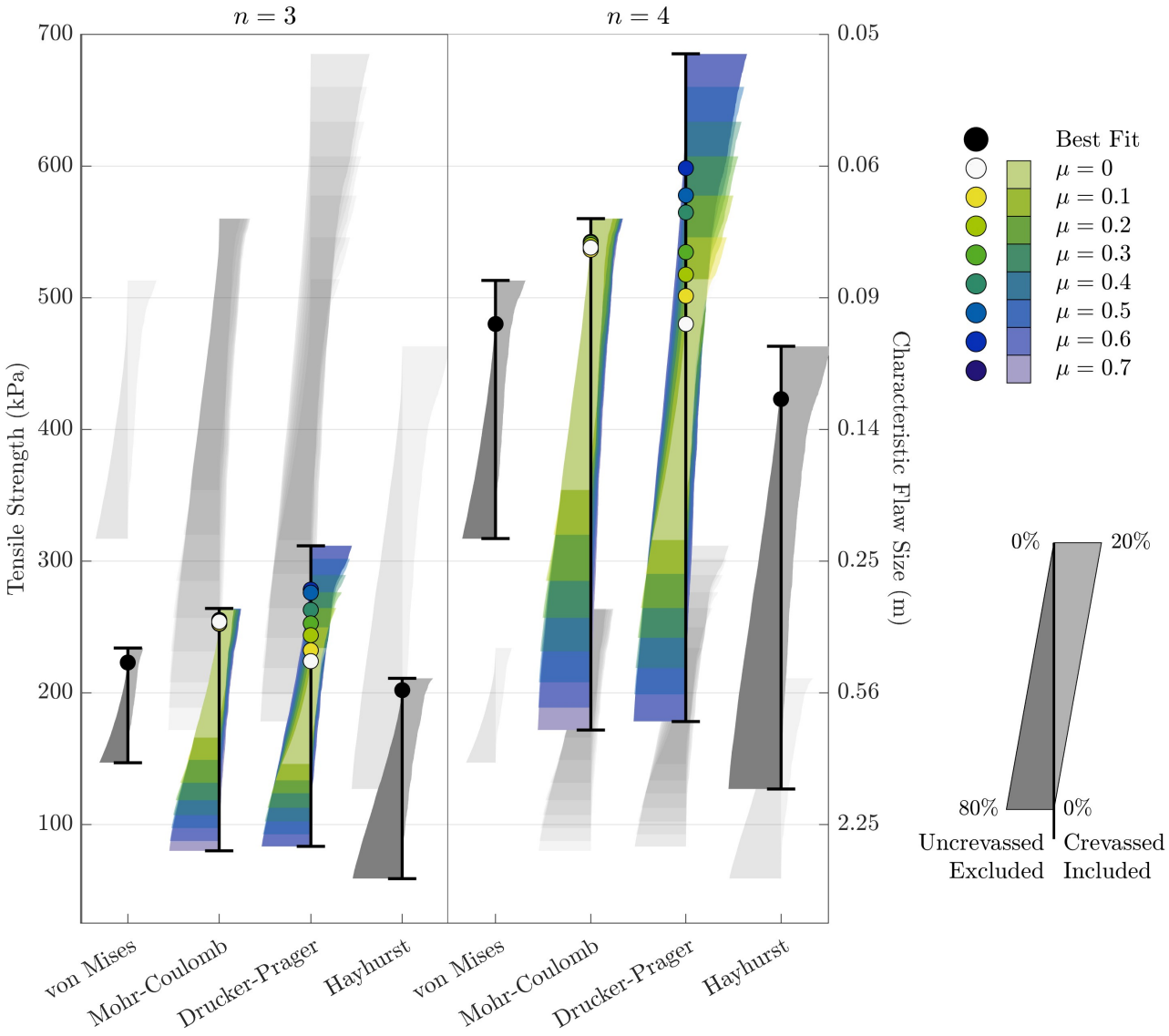

Fig. 2. The range of possible tensile strengths produced by our framework for each criterion. The range is plotted by an error bar that ends at minimum and maximum values of tensile strength, with a dot plotted for "Best Fit" values. For the Mohr-Coulomb and Drucker-Prager criteria, best fit values for each μ value tested are colored corresponding to the legend. To the left of each bar is a shaded shape, with width of the shape denoting the percentage of uncrevassed points excluded by a criterion defined by that tensile strength. On the right side of each error bar, the shaded shape represents the percentage of crevassed points included by the criterion defined by that tensile strength. For criteria with multiple μ values, each shape is shaded to correspond to its respective μ value

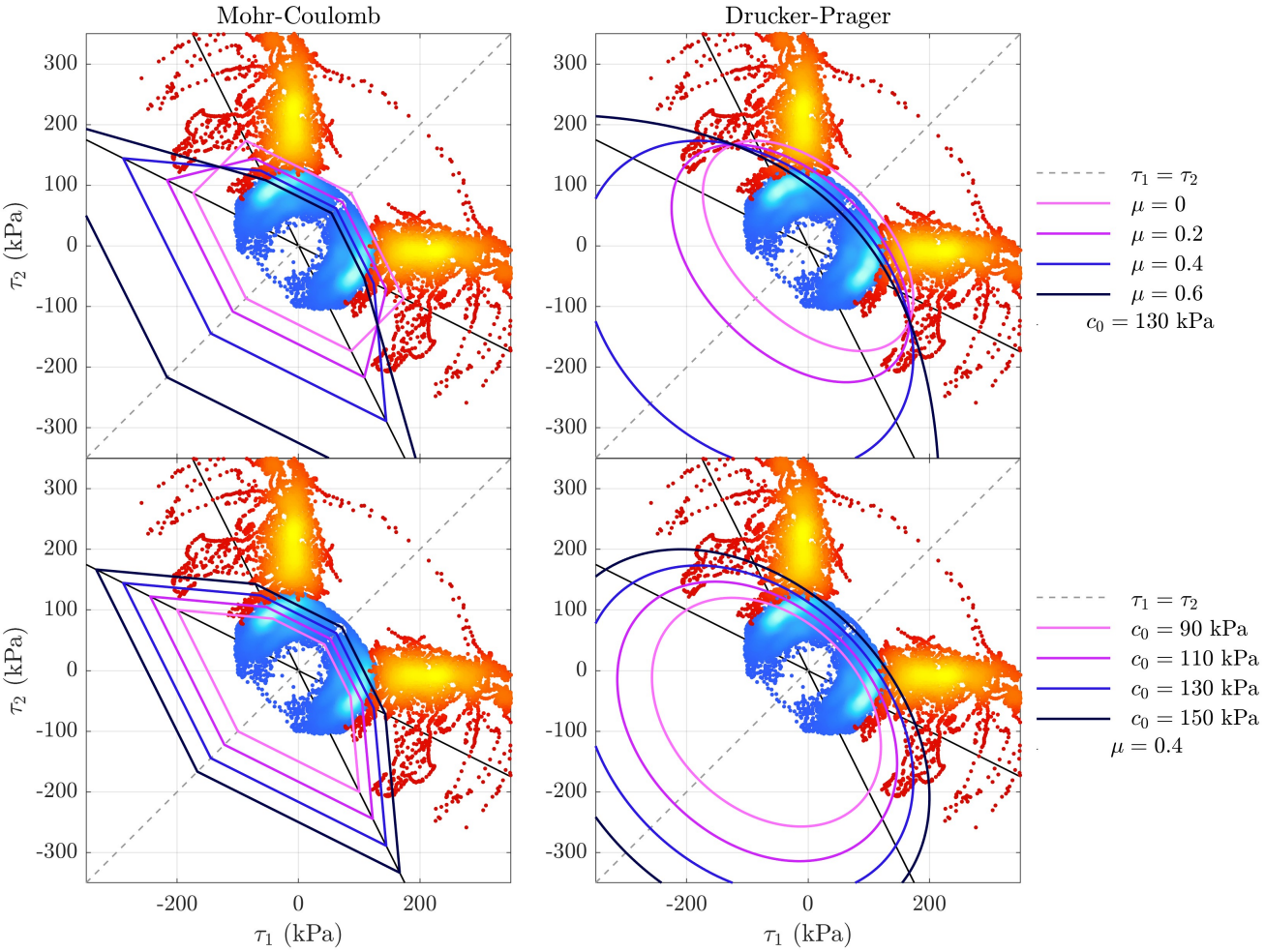

Fig. 3. The variations in shape of the Mohr-Coulomb and Drucker-Prager criteria caused by variations in c_0 and μ. In the first row, we show how the criteria vary with a constant c_0 and a varying μ. In the second row, we show a varying value of c_0 with a constant value of μ. All criteria are plotted over the crevassed and uncrevassed data assuming $n = 3$ shown in Figure 3 in the main text. The values of c_0 and μ are chosen to show variation in shape and size, rather than to fit the data

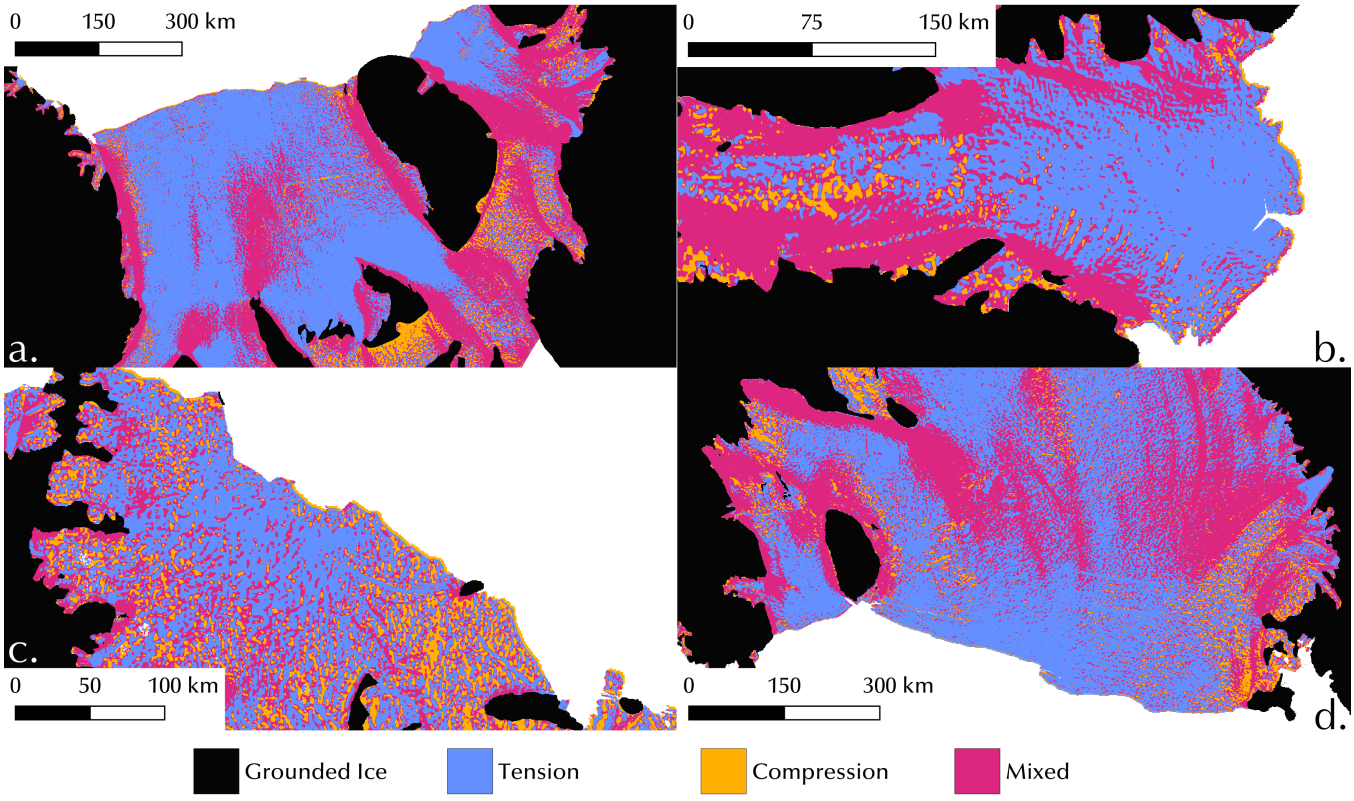

Fig. 4. A colorblind-accessible version of Figure 2 in the main text showing color-coded stress regimes on Antarctic ice shelves

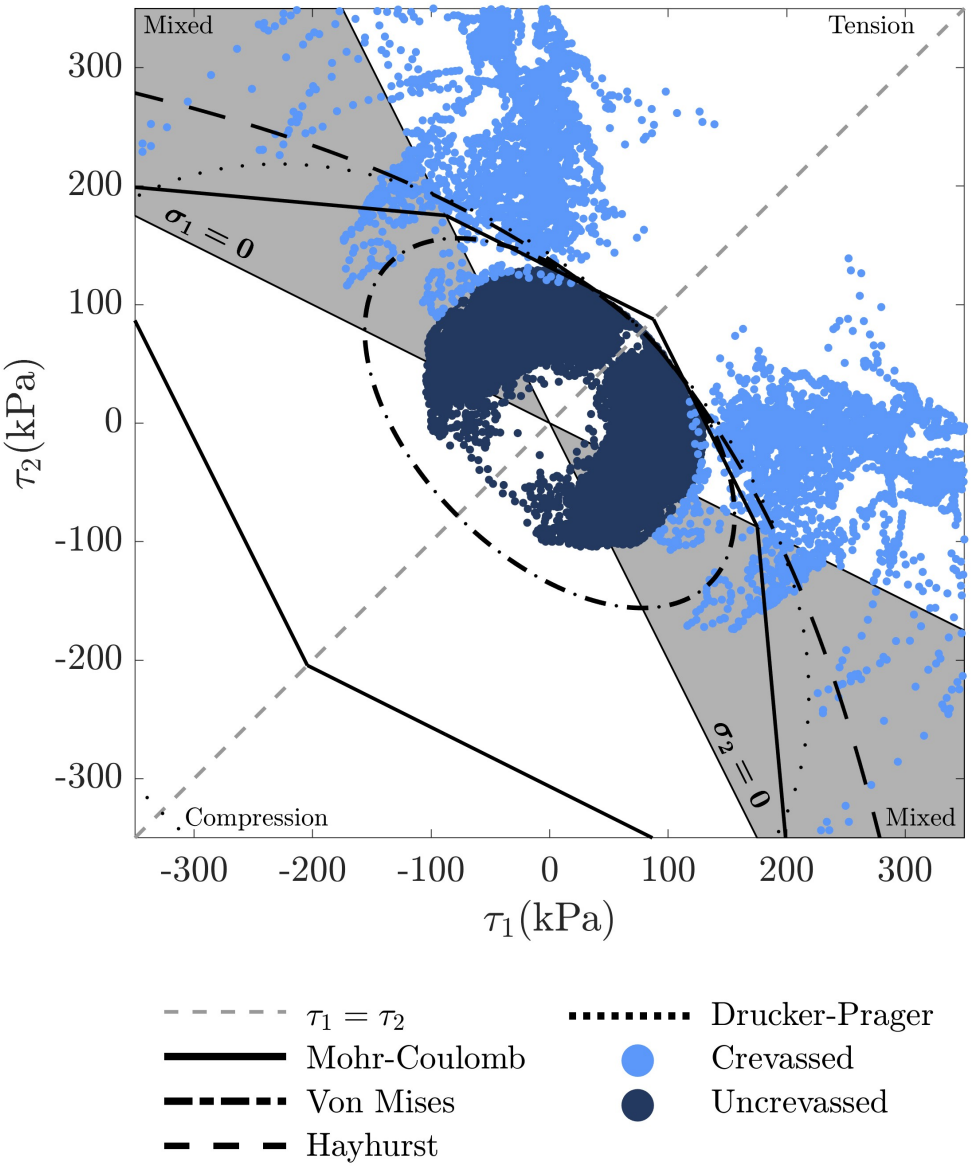

Fig. 5. A Protanopic/Deuteranopic-accessible version of Figure 3 in the main text. We exclude density plotting to ensure maximum color contrast.

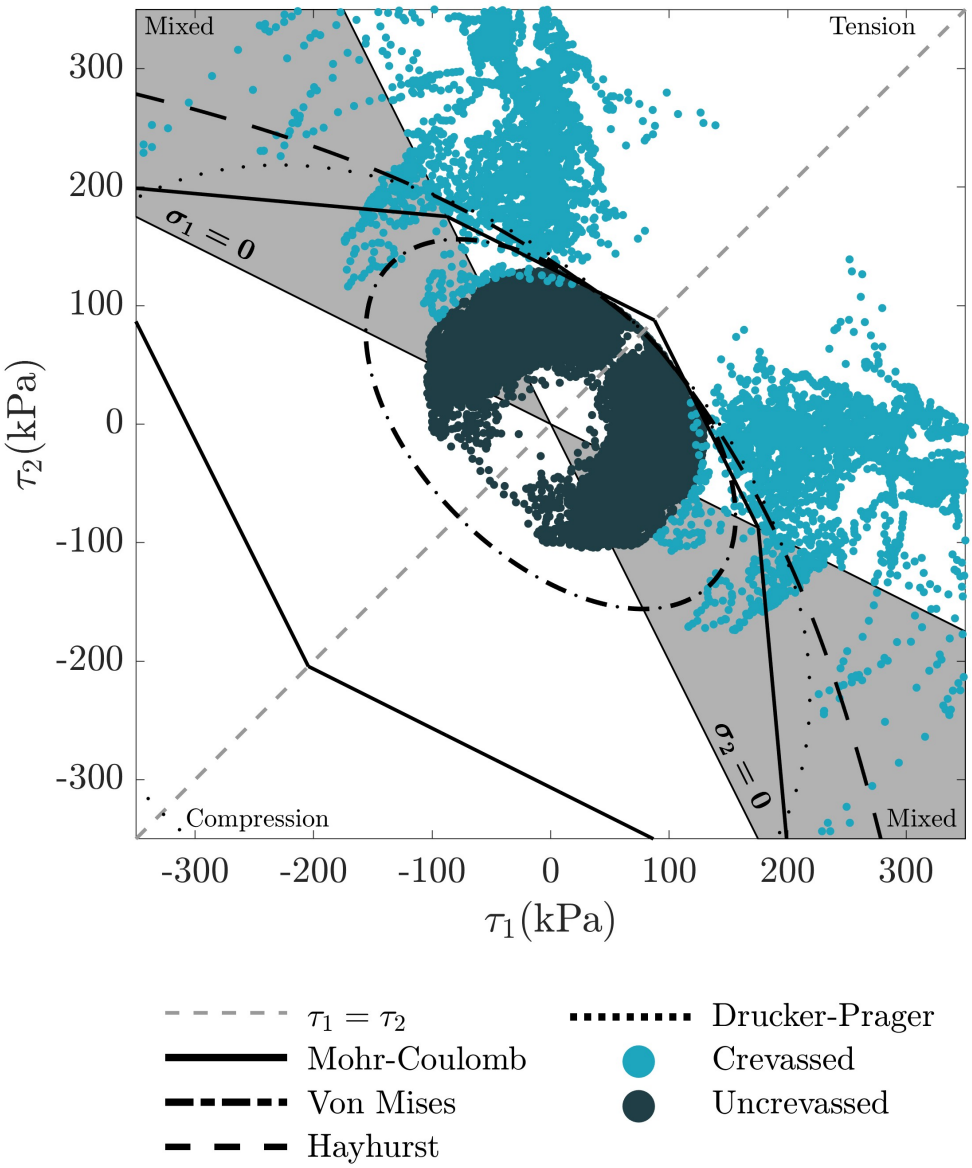

Fig. 6. A Tritanopic-accessible version of Figure 3 in the main text. We exclude density plotting to ensure maximum color contrast.