

**GSA Data Repository 2010113**

**Table DR1. Characterization and Elemental Oxide Data from the Modern Vertisol Climosequence**

Pedon	Horizon*	Depth	Clay	CEC	COLE	CaCO <sub>3</sub>	Ca <sup>2+</sup>	Mg <sup>2+</sup>	Na <sup>+</sup>	K <sup>+</sup>	Al <sub>2</sub> O <sub>3</sub>	CaO	MgO	Na <sub>2</sub> O	K <sub>2</sub> O
											(cm)				
Dalby†‡ 69NM 013-1	Bw	16-31	47.4	26.1	0.080	15	24.7	2.5	0.3	1.9	12.08	9.48	0.65	0.83	2.47
	Bss1	31-72	48.4	25.9	0.075	14	22.8	2.8	0.5	1.7	11.97	9.55	0.63	0.83	2.41
	Bss2	72-110	48.5	26.0	0.086	15	22.2	3.0	1.4	1.5	12.05	9.62	0.66	0.90	2.42
Catarinat 82TX 479-2	A2	8-36	51.2	36.3	0.116	12	60.7	3.3	6.5	1.3	12.0	7.79	1.48	1.44	1.55
	Bsskyz1	36-64	51.8	38.3	0.130	12	62.9	3.7	15.9	1.4	12.1	7.74	1.49	1.73	1.53
	Bsskyz2	64-90	51.0	34.6	0.130	13	84.2	3.6	19.2	0.9	11.8	8.07	1.44	1.73	1.48
Victoria‡ 01TX 355-2	Bsskyz3	90-127	48.6	33.2	0.106	11	99.7	3.4	18.6	0.8	11.5	8.36	1.42	1.71	1.43
	Bw	12-31	47.2	40.5	0.133	1	59.3	4.1	0.5	1.6	8.88	1.56	1.38	0.43	1.43
	Bss1	31-61	48.6	40.5	0.147	3	73.0	5.7	2.0	1.2	9.15	2.61	1.54	0.46	1.38
Victoria†‡ 01TX 409-3	Bss2	61-92	51.9	38.3	0.165	5	69.2	5.6	5.2	1.1	9.26	3.45	1.58	0.56	1.42
	Bkss	92-114	50.6	33.8	0.152	8	64.7	6.3	12.6	1.2	9.05	4.61	1.56	0.78	1.41
	Bw	10-26	52.8	42.0	0.148	0	33.2	6.5	0.8	1.5	10.20	1.17	1.26	0.50	1.44
	Bss1	26-54	52.3	36.9	0.143	1	43.3	6.4	1.7	1.1	10.29	1.27	1.32	0.46	1.41
	Bss2	54-75	51.8	35.4	0.157	1	57.0	7.4	4.4	1.2	9.62	1.80	1.28	0.56	1.35
	Bkss	75-114	51.6	30.7	0.173	3	58.7	8.2	7.7	1.1	10.05	2.62	1.45	0.60	1.44

Laewest‡ 99TX 391-1	A2	9-28	60.5	51.7	0.145	0	45.3	7.0	0.9	1.6	14.26	1.70	1.87	0.51	1.62
	Bss1	28-56	61.2	54.1	0.156	0	44.4	7.5	2.0	1.7	13.77	1.65	1.90	0.43	1.61
	Bss2	56-79	60.1	53.4	0.162	1	43.6	8.2	3.1	1.2	13.64	1.76	1.88	0.63	1.66
	Bkss	79-104	59.9	50.9	0.153	3	53.3	8.9	4.5	1.1	13.79	1.58	1.88	0.69	1.66
Burleson	2	20	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	12.68	2.85	1.69	0.15	1.53
	3	30	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	12.61	3.17	1.75	0.13	1.47
	4	40	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	11.99	2.84	1.42	0.07	1.41
	5	50	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	12.09	3.31	1.69	0.26	1.38
	6	60	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	11.85	2.63	1.51	0.06	1.35
	7	70	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	12.44	3.20	1.54	0.09	1.60
	8	80	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	11.27	3.39	1.36	0.13	1.26
	9	90	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	12.21	3.86	1.89	0.26	1.31
	10	100	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	12.01	2.88	1.53	0.13	1.35
	Bss1	16-43	49.8	46.3	0.145	0	34.3	8.1	1.6	0.5	11.29	1.33	1.08	0.37	0.66
Laewest‡ 99TX 469-1	Bss2	43-74	53.2	49.3	0.156	0	35.2	8.5	3.1	0.5	11.84	1.39	1.14	0.35	0.68
	Bss3	74-118	56.3	50.8	0.162	0	36.6	9.3	4.8	0.6	11.84	1.50	1.34	0.69	0.74
	A2	13-29	51.7	48.0	0.146	0	31.1	12.0	0.6	0.8	12.53	1.31	1.39	0.42	1.14
Laewest‡ 99TX 239-1	Bss1	29-56	52.3	48.1	0.152	0	31.4	12.8	0.7	0.7	12.24	1.29	1.37	0.45	1.14
	Bss2	56-94	53.5	48.6	0.148	0	31.1	15.5	0.9	0.9	12.57	1.24	1.54	0.49	1.12
	Bss3	94-141	51.3	43.1	0.144	4	44.2	19.6	1.2	0.7	12.04	1.60	1.55	0.59	1.16

Lake Charles‡ 99TX 481-1	A2	12-28	62.5	56.9	0.168	0	51.1	13.1	0.7	1.2	14.58	1.56	1.59	0.42	1.47
	Bss1	28-59	58.1	54.4	0.156	0	41.5	11.8	1.1	0.9	14.29	1.41	1.37	0.37	1.38
	Bss2	59-83	60.5	56.4	0.153	0	41.0	14.3	1.7	0.9	14.45	1.28	1.46	0.48	1.38
	Bss3	83-123	62.2	57.8	0.152	0	38.8	17.7	2.7	1.0	13.10	1.19	1.44	0.59	1.63
Lake Charles‡ 99TX 157-1	A2	10-29	53.1	49.8	0.158	0	40.7	11.7	0.5	0.8	12.31	1.46	1.12	nd	1.21
	Bss1	29-61	56.2	49.7	0.165	0	40.2	12.9	0.8	0.6	12.25	1.42	1.09	nd	1.19
	Bss2	61-103	56.7	50.1	0.140	0	38.6	14.8	1.9	0.7	11.94	1.32	1.08	nd	1.19
Redcot† 98TX 339-1	Bw1	20-31	50.2	38.6	0.115	0	13.3	7.3	0.5	0.4	11.48	0.46	0.77	0.13	0.75
	Bw2	31-47	47.4	35.5	0.121	0	11.1	7.6	0.6	0.4	11.07	0.40	0.72	0.14	0.73
	Bss1	47-56	51.1	36.9	0.129	0	13.6	7.5	0.8	0.4	11.49	0.47	0.76	0.15	0.72
	Bss2	56-106	55.6	40.9	0.135	0	15.8	8.7	1.4	0.4	12.50	0.54	0.86	0.16	0.77
LakeCharles‡ 99TX 201-1	Bw	16-44	35.8	28.2	0.098	0	16.4	9.4	1.1	0.4	9.13	0.41	0.60	0.76	0.86
	Bss1	44-65	37.3	28.5	0.093	0	16.5	10.6	1.5	0.5	11.24	0.55	0.98	0.67	1.02
	Bss2	65-88	46.3	35.0	0.132	0	19.1	14.5	2.2	0.7	11.31	0.48	1.04	0.69	1.00
	Bss3	88-117	52.5	39.3	0.131	0	21.6	17.9	3.0	0.6	12.81	0.60	1.30	0.65	1.14
League‡ 00TX 245-2	Bss1	20-43	43.1	38.0	0.128	0	27.6	4.2	0.7	0.2	11.84	1.35	0.76	0.48	0.72
	Bss2	43-57	41.0	39.1	0.138	0	26.4	4.0	0.8	0.2	13.47	1.48	0.93	0.50	0.77
	Bssg1	57-92	40.6	39.1	0.136	0	26.2	4.2	0.8	0.4	13.27	1.46	0.91	0.60	0.77
	Bssg2	92-116	40.5	37.8	0.128	0	26.1	4.3	0.9	0.2	12.67	1.31	0.86	0.67	0.76
League†‡ 00TX 245-1	Bss1	16-43	47.7	38.0	0.128	0	32.0	3.6	0.9	0.4	11.84	1.35	0.76	0.48	0.72

Bss2	43-72	51.1	39.1	0.138	0	33.3	3.7	1.0	0.4	13.47	1.48	0.93	0.50	0.77
Bss3	72-104	51.9	39.1	0.136	0	33.8	3.7	1.1	0.4	13.27	1.46	0.91	0.60	0.77

\*Horizon data given for the 25-100 cm critical depth interval for calculating MAP from the weathering indexes. The Burleson soil was sampled in 10 cm increments for elemental oxide analysis, but characterization data is not available (n/d). See Hallmark et al. (1986) for additional information on the Burleson series from nearby soil pits.

†Characterization data obtained from the USDA-NRCS (<http://ssldata.ncrs.usda.gov>) with elemental oxide analysis performed by the University of Tennessee-Knoxville geochemistry laboratory (see Driese et al., 2005).

‡Characterization data obtained from Texas A&M University (<http://soildata.tamu.edu/>) with elemental oxide analysis performed by ALS Chemex.

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