APPENDIX 4. Major element chemical analyses by AA and XRF, loss on ignition (LOI), all weight percent, and bulk density (g/cc) of Eocene paleosols from the Clarno area.

Paleosol	Hz	Field No.	JO DA	SiO_2	TiO_2	Al_2O_3	FeO	Fe_2O_3	MnO	CaO	MgO	K_2O	Na_2O	P_2O_5	LOI	Total	g / cc
type Pswa	A	PS-0	5060	58.38	1.17	16.12	0	5.92	0.005	0.79	1.22	0.78	1.92	0.03	13.98	100.32	2.03
	A	PS-15	5059	58.07	1.10	16.88	0	5.29	0.006	0.80	1.29	0.77	2.23	0.03	14.52	101.01	2.05
	Bt	PS-30	5058	58.06	0.43	17.42	0	4.91	0.010	0.66	1.25	2.51	2.09	0.06	11.46	98.73	1.91
	Bt	AB4	5057	63.79	1.00	17.23	0	4.53	0.005	0.76	1.33	0.63	1.92	0.01	12.67	103.88	2.04
clast	Bt	AB5	5057	52.56	0.40	17.08	4.831	9.91	0.042	1.24	0.99	2.04	3.14	0.11	6.39	98.74	2.24
	Bg	AB3	5056	62.42	1.12	16.60	0.046	6.69	0.007	0.87	1.38	0.66	1.87	0.02	12.81	104.48	2.05
	C	AB2	5054	60.50	1.18	16.05	0.046	8.19	0.012	0.70	1.34	0.63	2.01	0.02	12.06	102.75	2.05
	C	AB1	5053	61.25	0.39	17.18	0.189	6.49	0.043	2.14	0.61	2.10	4.38	0.13	4.66	99.56	2.25
Pswa	A	AB11	5066	61.33	1.05	15.18	0	8.93	0.010	0.75	1.22	0.73	2.07	0.01	12.58	103.84	2.14
	Bt	AB10	5065	63.82	1.07	15.45	0.046	7.15	0.008	0.65	1.29	0.71	2.12	0.01	11.81	104.12	2.07
	Bg	AB9	5064	61.69	1.17	17.82	0	4.12	0.006	0.90	1.33	0.70	1.90	0.01	13.04	102.69	2.10
	C	AB8	5063	64.15	1.00	16.54	0	4.09	0.004	0.87	1.20	0.74	2.01	0.01	12.41	103.01	2.03
	C	AB7	5062	64.84	0.39	18.68	0.095	3.15	0.013	1.27	0.92	2.08	3.92	0.13	7.23	102.73	2.01
	C	PS+15	5061	46.55	0.40	17.65	0.110	18.38	0.059	0.58	1.72	2.04	2.65	0.05	9.83	100.02	2.09
breccia	-	AB12	5067	62.03	1.10	16.35	0	6.89	0.007	0.81	1.32	0.71	2.27	0.01	13.49	105.01	2.15
basalt	-	AB38	5719	48.01	1.15	14.12	5.953	1.69	0.208	9.29	6.94	0.55	2.86	0.33	5.35	96.45	-
type Patat	A	HC8	5085	68.74	0.32	11.21	0.083	4.33	0.045	2.05	0.17	1.64	2.62	0.12	4.57	95.91	2.35
	A	HC9	5086	63.48	0.36	14.45	0	3.19	0.054	3.15	0.27	1.33	2.91	0.13	6.49	95.81	2.32
	Bw	HC10	5087	57.24	0.55	14.76	0	7.71	0.747	2.76	0.27	1.75	3.34	0.15	6.68	95.96	1.93
	Bw	HC11	5088	61.92	0.55	14.88	0	3.09	0.128	3.21	0.30	1.81	3.47	0.14	6.03	95.54	1.94
	C	HC12	5089	55.58	0.73	18.85	0	3.78	0.192	3.40	0.10	2.70	5.48	0.24	5.46	96.53	1.92
type Scat	A	CH10	4168	55.36	1.43	19.81	0	5.87	-	1.09	0.59	0.73	0.79	0.11	14.96	100.74	1.95
	A	CH11	4169	60.10	0.94	18.00	0	4.94	-	1.12	0.50	0.59	0.75	0.11	12.37	99.42	2.01
	C	CH12	4170	54.59	0.77	21.02	0	5.11	-	1.03	0.58	0.46	0.83	0.09	14.66	99.14	1.93
	C	CH13	4171	59.24	0.66	20.35	0	4.26	-	0.90	0.54	0.77	0.08	0.09	13.00	99.89	1.99
type Lakayx	A	CH2	4160	54.41	1.56	17.46	0	11.19	-	1.09	0.02	0.58	0.74	0.12	12.53	99.70	2.08
	Bt	CH5	4161	51.91	1.56	17.32	0	12.71	-	1.08	0.02	0.69	0.75	0.11	13.05	99.20	2.08
	Bt	CH4	4163	48.79	1.69	17.36	0	14.42	-	1.25	0.02	0.58	0.76	0.13	14.10	99.10	2.11
	Bt	CH6	4164	52.73	1.40	17.39	0	11.16	-	1.12	0.02	0.75	0.75	0.12	14.46	99.90	1.97
	Bt	CH7	4165	52.14	1.35	17.62	0	11.46	-	1.10	0.01	0.75	0.75	0.12	13.76	99.06	1.99
	BC	CH8	4166	53.12	1.24	17.59	0	11.31	-	1.01	0.01	0.73	0.73	0.13	12.87	98.74	1.99
	C	CH9	4167	50.87	1.30	16.51	0	12.88	-	1.11	0.03	0.79	0.79	0.13	14.80	99.21	2.02
Luca	A	CH41T	4193	54.13	1.34	15.63	0	7.50	-	1.62	0.92	1.02	0.94	0.08	16.36	99.54	1.95
	A	CH41	4194	54.70	1.43	14.66	0	7.19	-	1.41	0.85	1.07	0.90	0.08	17.32	99.61	1.96
	Bt	CH40	4195	52.01	1.72	15.70	0	9.80	-	1.44	0.82	0.98	0.82	0.09	15.86	99.24	2.02
	Bt	CH40B	4196	50.72	1.09	14.56	0	11.45	-	1.53	0.84	0.69	0.81	0.08	17.77	99.54	1.99
	BC	CH39T	4197	55.11	1.45	15.74	0	7.22	-	1.68	0.86	0.51	0.81	0.08	15.84	99.30	2.01
	C	CH39	4198	52.72	1.16	15.42	0	7.32	-	1.60	0.87	0.50	0.85	0.08	18.70	99.22	2.01
type Sitaxs	A	CH50	4199	53.29	1.12	15.95	0	8.41	-	1.60	0.90	0.68	0.94	0.16	16.49	99.54	2.05
	A	CH49	5000	53.79	1.17	15.03	0	6.71	-	1.97	1.06	0.67	1.01	0.19	18.02	99.62	2.02
	Bw	CH48	5001	55.37	1.12	15.85	0	5.77	-	1.92	1.10	0.70	0.94	0.17	16.57	99.51	1.94
	C	CH46	5003	54.56	1.21	16.35	0	6.51	-	1.53	1.12	0.63	1.00	0.18	16.57	99.66	2.01
	C	CH47	5002	54.44	1.21	15.79	0	5.93	-	1.63	1.15	0.73	0.93	0.20	17.28	99.29	1.92
type Acas	A	AK2	5101	52.18	1.53	16.22	0	11.69	0.044	2.05	0.51	0.74	0.51	0.02	15.24	100.73	1.96
	A	AK3	5102	50.7	1.65	16.74	0	12.45	0.040	2.10	0.49	0.74	0.54	0.02	15.73	101.21	2.00
	A	AK4	5103	50.36	1.66	16.84	0	12.51	0.046	2.12	0.46	0.76	0.52	0.02	16.70	101.99	2.00
	Bt	AK5	5104	50.77	1.66	17.30	0	11.22	0.017	2.15	0.42	0.75	0.60	0.02	16.44	101.35	1.98
	Bt	AK6	5105	50.52	1.73	17.65	0	11.18	0.036	2.13	0.52	0.63	0.61	0.02	16.54	101.57	2.06

APPENDIX 4. continued

Paleosol	Hz	Field No.	JO DA	SiO_2	TiO_2	Al_2O_3	FeO	Fe_2O_3	MnO	CaO	MgO	K_2O	Na_2O	P_2O_5	LOI	Total	g / cc
	Bt	AK7	5106	48.34	1.49	16.69	0	14.64	0.062	2.13	0.53	0.75	0.69	0.02	16.26	101.61	2.10
	C	AK8	5107	49.01	1.57	17.68	0	12.78	0.030	2.11	0.47	0.74	0.57	0.02	16.51	101.49	2.10
Micay	A	MQ16	5117	62.7	1.19	12.08	0	6.16	0.030	0.98	1.26	1.92	0.30	0.10	13.00	99.72	1.90
	C	MQ15	5118	61.5	1.36	12.54	0	6.38	0.050	1.17	1.34	1.94	0.33	0.09	13.20	99.90	1.87
Lakim	A	MQ21	5112	62.1	1.41	12.13	0	5.67	0.010	1.15	1.40	1.11	0.23	0.08	14.50	99.79	2.01
	A	MQ20	5113	59.4	1.40	12.37	0	7.22	0.030	1.21	1.40	0.94	0.20	0.08	15.60	99.85	1.97
	Bw	MQ19	5114	55.70	1.40	13.41	0	7.02	0.06	1.42	1.49	0.93	0.20	0.08	17.70	99.41	1.91
	Bw	MQ18	5115	56.70	1.45	13.99	0	6.40	0.030	1.33	1.65	1.03	0.21	0.9	16.70	99.58	1.88
	C	MQ17	5116	60.50	1.22	12.98	0	6.44	0.020	1.36	1.38	1.59	0.27	0.09	14.00	99.85	1.93
	C	MQ40	5116	60.00	1.35	12.80	0	6.17	0.030	1.09	1.37	1.58	0.26	0.09	14.80	99.54	1.93
	C	MQ41	5116	60.60	1.58	12.80	0	6.18	0.030	1.13	1.37	1.63	0.26	0.09	14.00	99.67	1.93
	C	MQ42	5116	60.00	1.25	13.06	0	6.36	0.030	1.13	1.36	1.61	0.27	0.09	14.20	99.36	1.93
type Micay	A	MQ23	5110	52.50	1.25	13.16	0	10.98	0.230	1.24	1.55	0.96	0.17	0.08	17.50	99.62	1.74
	C	MQ22	5111	58.60	1.41	13.30	0	5.56	0.020	1.34	1.60	0.85	0.21	0.07	16.80	99.76	1.95
siltstone	-	MQ24	5112	58.2	1.20	13.00	0	5.70	0.170	1.18	1.39	1.77	0.26	0.08	16.50	99.45	1.70
Pasct	A	R40	5045	71.48	0.97	9.48	0.082	1.91	0.014	0.98	0.49	1.72	0.75	0.01	8.00	95.89	1.86
	A	R41	5046	71.29	1.00	9.86	0.128	2.001	0.016	1.03	0.59	1.47	0.86	0.02	8.26	96.52	1.82
	A	R42	5047	57.40	1.41	17.10	0.028	4.85	0.014	1.54	1.08	0.67	0.53	0.01	15.77	100.41	1.76
	Bt	R43	5048	55.57	1.50	18.60	0	5.31	0.014	1.63	1.12	0.49	0.52	0.01	16.38	101.13	1.84
	Bt	R44	5049	57.66	1.40	16.31	0	5.96	0.014	1.53	1.04	0.45	0.59	0.01	14.95	99.92	1.90
	C	R45	5050	58.76	1.40	16.25	0	5.09	0.13	1.51	1.03	0.34	0.48	0.01	14.42	99.30	1.98
Luca	A	JD1	5119	59.46	1.46	16.13	0	5.31	0.060	2.26	0.66	0.80	1.57	0.09	12.33	100.13	-
	Bt	JD2	5120	59.26	1.52	16.20	0	5.59	0.050	2.12	0.63	0.82	1.54	0.10	12.16	99.99	-
	Bt	JD3	5121	57.68	1.58	16.42	0	6.75	0.060	2.11	0.62	0.92	1.51	0.08	12.15	99.88	-
	C	JD4	5122	53.2	1.67	17.17	0	8.85	0.080	2.08	0.61	1.03	1.37	0.13	14.03	100.22	-
	C	JD5	5123	51.5	1.58	17.36	0	10.20	0.080	1.84	0.57	1.08	1.21	0.07	14.70	100.19	-
error $\pm\sigma$ AA	-	-	-	0.25	0.02	0.17	0.08	0.15	0.005	0.10	0.05	0.01	0.05	0.004	-		0.04
error $\pm\sigma$ XRD	-	-	-	0.77	0.044	0.23	-	0.20	0.001	0.04	0.04	0.02	0.05	0.015	-	1.19	0.04

Note: For Appendices 4 and 5, dashes (-) signify analyses not attempted and zeroes (0) are values beyond detection. Analyses of Lakayx, Lakim, Luca, Micay and Sitaxs paleosols were from atomic absorption at the University of Oregon, Eugene by Christine McBirney (previously done for Smith, 1988; Pratt, 1988; Getahun and Retallack, 1991). Others from X-ray fluorescence at Washington State University, Pullman, by Diane Johnson and Peter Hooper were found to be incorrectly calibrated for silica and volatiles, and were corrected by normalizing to predicted loss on ignition established from an empirical relationship between XRF analytical shortfall (x) and measured loss on ignition ($y=0.01219x^3+0.2357x^2+2.208x-6.405$) of 105 paleosol samples. Density was calculated by weighing paraffin-coated clods in and out of water at the University of Oregon, Eugene, by Timothy Tate. Errors were estimated from 10 replicate analyses of standard rock W2 for AA, from 11 replicate analyses of Mt Rainier andesite courtesy of Steven Kuehn for XRF, and from 10 replicates of rock (HC9) for bulk density. An additional guide to quality of AA analyses are the 4 duplicate analyses of JODA5116 in Lakim clay.