

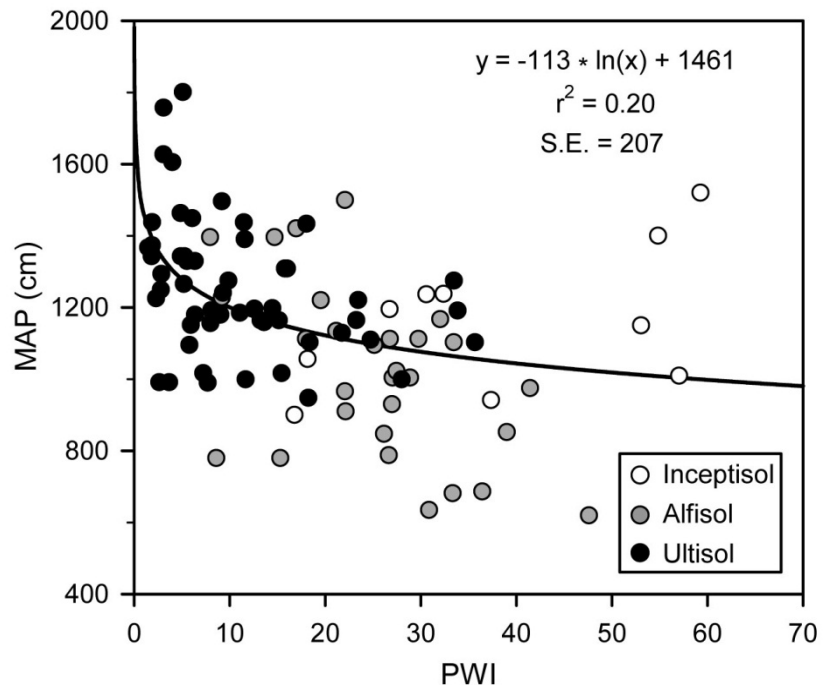


Figure DR1. PWI values for modern soils plotted against mean annual precipitation (MAP).

There is only a weak relationship between the PWI and MAP.

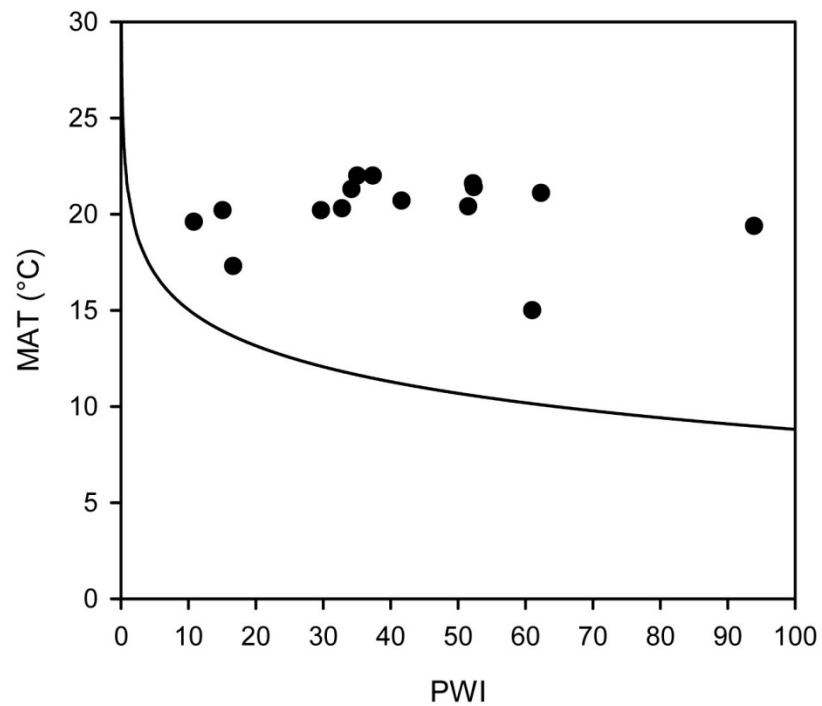


Figure DR2. PWI values for modern Vertisols plotted against MAT. There is no clear relationship between Vertisol PWI values and MAT. The curve shown for comparison is the logarithmic fit of the forest soils against MAT.

TABLE DR1. CALCULATION OF THE PWI COEFFICIENT

Ion	Coordination Number (CN)	Effective Ionic Radius* (r)	Charge (z)	Relative Bond Strength [†] (RBS)	Electronegativity [§] (X)	% Ionic Character [#] (IC)	PWI Coefficient ^{**}
Na ⁺	VIII	1.32	1	0.30	0.93	0.79	4.20
Mg ²⁺	VI	0.86	2	0.89	1.31	0.68	1.66
K ⁺	XII	1.78	1	0.22	0.82	0.82	5.54
Ca ²⁺	VIII	1.26	2	0.63	1.00	0.77	2.05

Note: The cation effective ionic radii of were selected according to their most common coordination state. Different coordination states were tested, which had the effect of scaling the coefficients, but not significantly affecting any relationships.

* Shannon (1976).

† $RBS = 2 * z / (r + 1.26)^2$, (Nicholls, 1963).

§ Pauling (1960).

$\%IC = 1 - \exp[-0.25 * (3.44 - X)^2]$, (Pauling, 1960).

** $PWI\ Coeff = 1 / (RBS * IC)$.

TABLE DR2. MODERN SOIL CHEMISTRY DATA

Soil Order	Latitude (°W)	Longitude (°N)	Horizon	CaO	MgO	K ₂ O	Na ₂ O	Reference	PWI	MAT (°C)	MAP (mm)
Inceptisol	77.11	41.27	B	0.36	0.51	1.58	0.80	1	18.13	9.9	1056
Inceptisol	73.13	42.44	B	1.11	0.85	2.60	1.14	1	30.57	6.9	1237
Inceptisol	71.25	42.06	B	1.40	0.77	1.11	2.59	1	32.37	9.5	1238
Inceptisol	82.25	35.44	B	0.24	0.80	3.14	0.60	1	26.70	12.7	1196
Inceptisol	93.62	40.08	B	0.91	1.33	0.78	0.50	1	16.78	10.6	900
Inceptisol	122.59	45.51	B	1.60	1.06	2.17	2.12	1	37.34	11.9	942
Inceptisol	121.62	40.50	B	3.70	3.30	1.30	2.70	3	53.05	8.3	1150
Inceptisol	120.53	38.57	B	5.20	2.70	1.50	3.00	3	59.28	3.0	1520
Inceptisol	120.53	38.57	B	4.70	2.70	1.40	2.70	3	54.83	4.5	1400
Inceptisol	119.32	37.02	B	5.00	3.10	2.00	2.10	3	57.03	9.1	1010
Alfisol	89.61	46.82	B	0.84	0.71	2.20	1.76	1	30.86	5.8	852
Alfisol	92.94	47.43	B	1.87	0.82	1.43	3.01	1	39.02	3.4	682
Alfisol	93.57	47.55	B	1.03	1.66	2.48	1.20	1	33.32	2.9	687
Alfisol	96.53	47.54	B	1.68	1.66	2.51	1.28	1	36.41	4.3	635
Alfisol	86.39	35.84	B	0.18	0.54	0.82	0.04	1	7.92	14.2	1396
Alfisol	87.14	35.58	B	0.48	0.46	1.51	0.32	1	14.70	14.2	1396
Alfisol	77.29	42.85	B	0.59	0.93	2.25	1.02	1	26.13	8.9	848
Alfisol	85.77	39.79	B	1.14	1.59	2.51	1.18	1	33.43	10.9	1103
Alfisol	84.98	39.83	B	0.62	0.92	2.35	1.07	1	27.02	10.4	1005
Alfisol	83.41	39.94	B	2.92	2.56	2.48	0.83	1	41.42	10.1	975
Alfisol	85.57	39.18	B	1.11	1.03	2.03	0.96	1	26.74	11.3	1112
Alfisol	84.98	39.83	B	1.38	1.35	1.92	1.04	1	28.87	10.4	1005
Alfisol	91.17	42.12	B	0.67	1.03	2.03	1.23	1	26.96	9.8	930
Alfisol	84.14	39.12	B	0.43	0.73	1.58	1.07	1	21.12	11.5	1135
Alfisol	85.22	38.21	B	0.71	0.76	1.73	0.54	1	19.50	11.8	1221
Alfisol	85.48	39.34	B	1.32	1.01	2.25	1.11	1	29.74	11.3	1112
Alfisol	85.43	39.21	B	0.44	0.80	1.16	0.93	1	17.97	11.3	1112
Alfisol	81.94	40.81	B	0.33	0.79	2.04	0.83	1	22.05	9.6	966
Alfisol	89.93	32.27	B	0.22	0.51	1.40	0.86	1	16.95	17.8	1421
Alfisol	89.81	33.77	B	0.55	0.02	2.12	1.11	1	22.05	16.4	1500
Alfisol	94.66	31.60	B	0.02	0.80	0.64	0.30	1	9.17	18.9	1228
Alfisol	80.90	35.83	B	1.97	3.96	0.11	1.16	1	32.01	14.7	1168
Alfisol	79.79	36.07	B	2.92	1.25	0.21	1.19	1	25.12	14.5	1096
Alfisol	92.33	38.95	B	0.85	1.23	1.96	1.14	1	27.42	12.2	1023
Alfisol	123.46	42.34	B	1.19	0.57	1.83	1.36	1	26.63	11.8	788
Alfisol	121.62	40.50	B	0.80	1.30	0.50	0.60	3	15.28	16.7	780
Alfisol	120.53	38.57	B	0.40	0.40	0.70	0.20	3	8.58	15.6	780
Alfisol	119.32	37.02	B	0.20	0.70	2.80	0.30	3	22.11	11.1	910
Alfisol	119.32	37.02	B	3.20	1.30	2.20	2.60	3	47.61	14.4	620
Ultisol	76.18	38.41	B	0.74	0.26	1.97	0.44	1	18.34	13.3	1103
Ultisol	75.51	37.90	B	0.20	0.40	1.65	0.49	1	15.40	13.5	1017
Ultisol	76.08	38.77	B	0.40	0.55	2.06	1.09	1	23.23	14.4	1165
Ultisol	75.55	37.89	B	0.22	0.42	0.61	0.16	1	7.21	13.5	1017
Ultisol	76.87	38.78	B	0.30	1.09	2.91	0.30	1	24.73	13.2	1110
Ultisol	75.37	39.71	B	0.19	0.33	0.36	0.56	1	7.97	12.3	1157
Ultisol	74.47	40.16	B	0.46	0.40	1.14	0.38	1	12.56	12.2	1197
Ultisol	77.12	38.90	B	0.22	0.99	2.77	1.01	1	27.99	14.2	999
Ultisol	78.30	38.26	B	0.16	0.37	1.13	0.08	1	9.30	13.9	1241
Ultisol	77.04	38.90	B	0.38	0.53	0.84	0.47	1	11.64	14.2	999
Ultisol	85.69	39.75	B	1.09	1.68	2.70	1.31	1	35.66	10.9	1103
Ultisol	87.14	37.34	B	0.57	0.68	2.09	0.93	1	23.42	14.8	1221
Ultisol	77.97	35.36	B	0.31	0.07	0.40	0.21	1	5.20	13.8	1266
Ultisol	79.68	34.62	B	0.17	0.18	0.16	0.20	1	3.66	17.1	992
Ultisol	81.10	33.82	B	0.10	0.11	0.25	0.00	1	2.30	17.6	1226
Ultisol	77.92	33.72	B	0.00	0.26	0.35	1.67	1	14.45	15.6	1198
Ultisol	79.68	34.62	B	0.27	0.32	0.23	0.00	1	3.65	17.1	992

Ultisol	79.68	34.62	B	0.05	0.04	0.25	0.12	1	2.61	17.1	992
Ultisol	84.19	31.22	B	0.48	0.08	0.18	0.31	1	5.24	19.1	1343
Ultisol	84.19	31.22	B	0.07	0.00	0.17	0.08	1	1.80	19.1	1343
Ultisol	83.98	30.84	B	0.22	0.13	0.04	0.04	1	1.85	19.7	1373
Ultisol	85.39	31.22	B	0.00	0.00	0.11	0.18	1	1.87	18.7	1438
Ultisol	84.78	31.64	B	0.19	0.11	0.43	0.40	1	6.33	18.9	1330
Ultisol	83.25	31.59	B	0.00	0.12	0.55	0.32	1	5.90	18.8	1152
Ultisol	83.59	31.18	B	0.28	0.12	0.04	0.16	1	2.84	19.2	1294
Ultisol	84.09	31.07	B	0.37	0.16	0.18	0.27	1	4.88	19.1	1343
Ultisol	82.20	28.36	B	0.16	0.00	0.12	0.03	1	1.45	22.3	1368
Ultisol	81.25	29.41	B	0.16	0.00	0.17	0.22	1	3.08	18.8	1758
Ultisol	88.71	32.44	B	0.26	0.14	0.37	0.35	1	6.07	17.7	1449
Ultisol	86.96	31.43	B	0.17	0.13	0.32	0.00	1	3.05	18.3	1627
Ultisol	85.11	31.88	B	0.00	0.11	0.22	0.56	1	5.51	18.9	1330
Ultisol	86.62	31.83	B	0.25	0.35	0.30	0.12	1	4.85	18.7	1464
Ultisol	84.28	30.44	B	0.60	0.22	0.15	0.00	1	3.99	20.0	1606
Ultisol	86.35	33.28	B	0.14	0.63	0.81	0.53	1	11.46	17.5	1438
Ultisol	86.86	33.10	B	0.13	0.50	1.06	0.06	1	9.17	16.8	1496
Ultisol	81.96	35.37	B	0.18	0.67	1.40	0.64	1	15.99	14.1	1309
Ultisol	82.04	35.41	B	0.00	0.88	1.66	0.36	1	15.78	14.1	1309
Ultisol	80.77	36.12	B	0.00	0.22	1.07	0.95	1	13.59	13.6	1159
Ultisol	82.65	34.50	B	0.00	0.42	1.10	0.42	1	11.05	16.2	1185
Ultisol	84.20	33.12	B	0.00	0.03	1.28	0.20	1	9.01	16.1	1180
Ultisol	84.30	33.77	B	0.06	0.22	1.16	0.28	1	9.84	16.7	1275
Ultisol	83.67	34.39	B	0.30	0.77	1.11	0.11	1	11.54	15.9	1391
Ultisol	83.50	34.52	B	0.00	0.09	0.80	0.00	1	5.09	13.8	1801
Ultisol	85.19	32.87	B	0.00	1.41	1.69	0.34	1	18.02	16.4	1434
Ultisol	82.74	33.74	B	0.43	0.14	0.73	0.24	1	8.07	16.2	1192
Ultisol	77.83	36.53	B	0.22	0.22	1.65	0.27	1	13.21	14.9	1165
Ultisol	77.79	36.47	B	0.00	0.74	1.71	0.30	1	15.14	14.9	1165
Ultisol	79.66	36.35	B	0.20	0.09	3.99	1.37	1	33.83	14.3	1192
Ultisol	84.17	33.81	B	0.19	0.24	4.94	0.40	1	33.45	16.7	1275
Ultisol	82.81	35.67	B	0.27	0.18	1.25	1.36	1	18.21	13.2	948
Ultisol	84.20	33.12	B	0.09	0.15	0.70	0.20	1	6.35	16.1	1180
Ultisol	79.79	36.07	B	0.39	0.49	0.40	0.00	1	5.77	14.5	1096
Ultisol	94.81	37.11	B	0.77	1.07	1.20	1.10	1	21.73	13.4	1130
Ultisol	121.62	40.50	B	0.30	0.70	0.40	0.20	3	7.69	14.2	990
Ultisol	120.53	38.57	B	0.10	0.30	0.20	0.00	3	2.78	13.3	1250
Mollisol	85.19	40.78	B	1.59	1.53	2.68	0.71	1	32.68	9.9	928
Mollisol	97.18	41.14	B	0.95	0.89	1.90	1.12	1	25.90	10.4	764
Mollisol	92.38	42.45	B	0.80	0.55	1.51	1.25	1	22.54	8.4	842
Mollisol	95.65	40.74	B	1.02	0.69	1.73	1.99	1	30.23	10.5	880
Mollisol	95.65	40.74	B	0.70	1.04	2.08	1.32	1	28.02	10.5	880
Mollisol	95.92	40.97	B	1.03	1.12	2.29	1.14	1	29.57	10.2	855
Mollisol	93.06	41.70	B	0.86	1.33	2.01	0.91	1	26.61	9.6	874
Mollisol	97.37	37.27	B	0.85	0.97	2.32	0.92	1	26.98	13.9	827
Mollisol	97.63	39.82	B	1.18	1.36	2.91	1.14	1	34.75	11.6	785
Mollisol	107.07	52.79	B	8.40	3.13	1.85	1.34	1	63.55	1.6	353
Mollisol	103.67	50.53	B	6.80	2.73	1.77	0.89	1	52.54	2.1	398
Mollisol	96.66	43.98	B	9.61	2.52	1.51	0.96	1	60.89	6.4	602
Mollisol	96.66	43.98	B	9.60	2.90	1.67	0.94	1	63.22	6.4	602
Mollisol	99.38	40.44	B	3.41	1.60	2.81	0.98	1	42.22	9.8	661
Mollisol	98.94	38.52	B	2.15	1.59	2.53	1.40	1	38.72	13.4	672
Mollisol	99.89	38.08	B	2.31	1.52	2.76	1.20	1	38.98	11.6	555
Mollisol	101.83	35.22	B	2.64	1.37	2.48	1.03	1	36.86	13.9	501
Mollisol	100.30	34.01	B	5.07	1.43	2.45	1.02	1	45.74	16.5	612
Mollisol	101.80	33.68	B	14.09	1.67	1.34	0.30	1	68.29	15.4	475
Mollisol	97.59	40.64	B	1.94	1.63	2.52	1.41	1	38.12	10.2	731
Mollisol	96.68	40.81	B	0.96	0.71	1.74	0.88	1	22.63	10.7	755

Mollisol	117.37	47.28	B	1.54	0.99	2.14	1.62	1	33.27	8.3	195
Mollisol	100.89	46.83	B	6.69	2.69	2.28	0.91	1	55.11	5.5	433
Mollisol	103.62	48.15	B	5.79	2.00	2.33	0.91	1	49.27	4.9	360
Mollisol	102.97	41.41	B	4.42	1.60	3.07	1.55	1	51.30	9.1	486
Mollisol	103.66	43.02	B	7.65	1.58	2.17	1.07	1	54.48	8.1	437
Mollisol	104.38	42.03	B	7.44	1.90	2.40	1.06	1	56.32	8.7	352
Mollisol	102.79	46.88	B	3.49	2.24	2.24	1.32	1	44.10	6.1	415
Mollisol	101.05	39.40	B	8.16	1.84	2.55	1.46	1	62.24	10.1	528
Mollisol	102.35	38.82	B	7.78	1.66	1.94	2.46	1	63.35	11.3	406
Mollisol	112.58	39.35	B	14.55	4.34	2.09	1.16	1	91.21	10.1	214
Mollisol	120.53	38.57	B	2.60	1.80	1.00	1.60	3	33.64	17.0	460
Entisol	81.79	26.14	B	1.94	0.03	0.11	0.03	1	8.07	23.4	1318
Entisol	121.62	40.50	B	4.50	6.00	0.90	2.30	3	62.03	6.5	1340
Entisol	119.32	37.02	B	1.30	0.40	4.30	2.80	3	50.66	7.2	1080
Entisol	115.60	30.97	B	4.50	1.70	1.40	4.10	3	59.47	7.4	626
Entisol	115.60	30.97	B	4.20	2.40	2.00	3.00	3	57.33	12.2	454
Entisol	115.60	30.97	B	5.10	2.60	0.70	3.50	3	57.18	17.1	275
Aridisol	105.50	44.29	B	4.37	1.26	2.18	1.54	1	44.42	6.7	435
Aridisol	114.46	42.56	B	10.80	3.41	1.98	1.80	1	77.36	8.6	279
Aridisol	112.58	33.37	B	16.07	1.60	1.80	0.90	1	82.02	21.6	201
Aridisol	114.89	39.25	B	8.61	2.50	2.61	1.26	1	65.65	7.1	253
Aridisol	119.01	43.14	B	9.74	3.30	1.63	2.36	1	74.77	6.8	268
Aridisol	118.58	43.42	B	5.67	2.72	2.54	2.88	1	66.38	6.8	268
Vertisol	96.69	32.83	B	21.98	1.35	1.16	0.18	1	93.89	19.4	941
Vertisol	106.73	32.61	B	9.35	1.63	2.37	0.90	2	60.96	15.0	267
Vertisol	99.50	27.56	B	7.16	1.37	1.46	1.75	2	52.30	21.4	544
Vertisol	97.55	27.56	B	5.09	1.42	1.36	0.72	2	37.32	22.0	755
Vertisol	97.35	28.11	B	3.99	1.41	1.47	0.88	2	35.00	22.0	894
Vertisol	97.12	28.47	B	7.27	2.17	1.72	0.97	2	52.19	21.6	924
Vertisol	97.76	28.72	B	4.84	1.48	0.91	0.74	2	34.16	21.3	1000
Vertisol	96.40	28.88	B	11.08	2.10	1.24	0.86	2	62.26	21.1	1066
Vertisol	96.08	29.43	B	2.95	1.95	1.63	0.65	2	32.77	20.3	1124
Vertisol	95.88	29.60	B	7.42	2.26	1.66	0.78	2	51.46	20.4	1170
Vertisol	95.76	30.51	B	0.51	0.81	0.77	0.16	2	10.79	19.6	1202
Vertisol	95.07	29.59	B	4.30	2.27	1.69	0.98	2	41.59	20.7	1321
Vertisol	94.32	29.87	B	1.37	0.86	0.77	0.29	2	15.04	20.2	1411
Vertisol	94.19	30.04	B	4.07	1.10	0.88	0.75	2	29.66	20.2	1437
Vertisol	88.11	32.40	B	0.13	1.38	1.53	0.22	2	16.62	17.3	1450
Spodosol	73.12	42.36	B	0.64	0.37	3.43	0.57	1	27.85	8.2	1184
Spodosol	67.83	46.13	B	0.19	1.06	1.37	1.32	1	22.06	4.9	1050
Andisol	116.92	47.40	B	1.70	1.31	2.08	1.89	1	36.55	9.0	662
Andisol	120.53	38.57	B	2.90	3.70	0.70	1.40	3	39.44	7.6	1350
Andisol	120.53	38.57	B	3.10	3.80	0.80	1.10	3	39.14	11.3	1300

Note: Reference 1—major element data from Marbut (1935), climatic data from National Climatic Data Center (2002). Reference 2—major element and climatic data from Nordt and Driese (2010). Reference 3—major element and climatic data from Rasmussen and Tabor (2007). Major element data from Reference1 were measured using wet chemistry techniques, while References 2 and 3 used x-ray fluorescence techniques with comparable error.

TABLE DR3. OREGON PALEOSOL DATA

Locality	Specimen	Age (Ma)	CaO	MgO	K ₂ O	Na ₂ O	PWI	MAT (°C)	MAT 3pt. Avg. (°C)
Helix, OR	JODA9338	0.00	2.61	1.49	2.04	2.11	41.97	11.2	-
Helix, OR	JODA9339	0.02	2.61	1.74	2.09	2.20	43.90	11.0	10.9
Helix, OR	JODA9340	0.04	4.63	1.92	1.87	2.36	51.82	10.6	10.8
Helix, OR	JODA9341	0.06	4.26	2.09	1.80	2.35	50.69	10.7	10.7
Helix, OR	JODA9342	0.09	3.05	2.07	1.91	2.33	46.69	10.9	10.7
Helix, OR	JODA9343	0.12	4.55	2.47	1.82	2.27	52.89	10.5	10.6
Helix, OR	JODA9344	0.13	5.07	2.78	1.66	2.19	54.58	10.5	10.4
Helix, OR	JODA9345	0.16	6.15	2.58	1.85	2.05	57.87	10.3	10.2
Helix, OR	JODA9346	0.18	10.07	2.13	1.61	2.12	69.41	9.8	10.2
Helix, OR	JODA9347	0.21	3.94	2.04	1.83	2.54	50.78	10.6	10.3
Washtucna, WA	JODA9337	1.02	5.47	2.48	2.03	1.94	55.29	10.4	10.4
Washtucna, WA	JODA9336	1.90	6.42	2.32	2.18	2.17	60.55	10.2	10.6
Taunton, WA	JODA9335	3.01	1.76	2.09	2.41	1.59	39.99	11.3	10.9
Richland, WA	JODA9334	4.17	1.42	1.59	2.54	1.90	39.55	11.3	11.4
Richland, WA	JODA9325	4.45	1.39	1.85	2.62	0.99	34.81	11.7	11.5
McKay Reservoir, OR	JODA9320	5.27	3.35	1.80	1.13	1.51	36.53	11.5	11.3
Rattlesnake Creek, OR	JODA7624	7.04	5.35	2.90	0.88	2.00	50.22	10.7	11.1
Rattlesnake Creek, OR	JODA7608	7.15	4.04	1.80	0.82	2.17	41.71	11.2	11.0
Rattlesnake Creek, OR	JODA7634	7.15	3.30	1.69	1.78	2.13	43.92	11.0	10.6
Rattlesnake Creek, OR	JODA7618	7.15	8.97	4.46	0.50	2.65	72.05	9.7	10.8
Rattlesnake Creek, OR	JODA7597	7.17	2.72	2.82	1.38	0.82	35.23	11.6	10.8
Rattlesnake Creek, OR	JODA7603	7.17	1.50	2.90	1.45	2.90	45.60	10.9	11.4
Juntura, OR	JODA9317	10.47	0.93	0.62	3.42	1.55	36.57	11.5	11.5
Juntura, OR	JODA9314	10.56	1.66	0.62	1.57	1.90	30.73	12.0	11.7
Juntura, OR	JODA9312	10.60	2.08	0.91	1.45	2.31	35.53	11.6	12.0
Unity, OR	JODA9246	11.76	1.24	0.76	0.97	1.77	25.36	12.5	12.4
Unity, OR	JODA9231	11.81	1.07	0.84	1.05	0.95	19.98	13.2	12.6
Unity, OR	JODA9225	11.98	1.59	0.99	1.35	1.53	28.20	12.2	12.4
Mascall Ranch, OR	M-02-3d4	14.38	2.91	1.14	0.78	1.85	32.45	11.9	12.3
Mascall Ranch, OR	M-02-1d5	14.66	1.91	1.55	0.76	0.87	23.73	12.7	12.4
Mascall Ranch, OR	M-02-2d4	14.69	1.95	1.34	0.74	0.96	23.50	12.7	12.7
Mascall Ranch, OR	JODA9322	14.80	1.99	1.14	0.95	1.14	25.28	12.5	12.4
Mascall Ranch, OR	M-02-4d4	14.88	2.71	1.74	1.04	1.02	30.10	12.1	12.3
Mascall Ranch, OR	MA46	15.13	2.51	1.61	0.68	1.21	28.00	12.3	12.1
Mascall Ranch, OR	MA45	15.16	3.14	1.43	0.80	1.51	32.30	11.9	12.0
Mascall Ranch, OR	MA44	15.18	2.65	1.42	0.80	1.60	31.08	12.0	12.2
Mascall Ranch, OR	MA41	15.22	0.72	1.57	0.57	1.47	22.41	12.9	12.3
Mascall Ranch, OR	MA40	15.23	1.31	1.76	0.93	1.67	28.82	12.2	12.4
Mascall Ranch, OR	MA39	15.23	1.64	1.48	0.77	1.58	27.32	12.3	12.3
Mascall Ranch, OR	MA38	15.25	2.00	1.50	1.00	1.10	26.82	12.4	12.0
Mascall Ranch, OR	5d2	15.27	3.10	1.18	1.33	2.05	37.90	11.4	12.2
Mascall Ranch, OR	MA36	15.30	2.15	1.50	1.04	0.30	22.18	12.9	12.3
Mascall Ranch, OR	MA32-3	15.43	2.17	1.71	0.78	0.82	25.12	12.5	12.5
Mascall Ranch, OR	MA31-4	15.43	3.08	1.90	0.89	1.00	31.09	12.0	12.3
Mascall Ranch, OR	MA29-1	15.44	2.17	1.62	0.95	0.99	26.90	12.4	12.1
Mascall Ranch, OR	MA28-5	15.45	2.62	1.66	1.14	1.44	32.87	11.8	12.0
Mascall Ranch, OR	MA28-1	15.45	2.88	1.80	1.18	1.23	33.21	11.8	11.8
Mascall Ranch, OR	MA26-3	15.48	3.00	1.74	1.07	1.07	31.67	11.9	11.8
Mascall Ranch, OR	MA26-1	15.48	3.00	1.60	0.90	1.50	33.01	11.8	11.9
Mascall Ranch, OR	MA20-3	15.55	2.17	1.87	1.11	1.17	30.09	12.1	12.0
Mascall Ranch, OR	MA20-1	15.55	2.07	1.79	1.08	1.12	28.88	12.2	12.1
Mascall Ranch, OR	MA18.5	15.56	2.33	1.87	0.99	1.17	29.97	12.1	12.0
Mascall Ranch, OR	MA18-2	15.56	2.71	1.81	1.13	1.24	32.41	11.9	12.1
Mascall Ranch, OR	MA9A2	15.63	2.22	1.96	1.02	0.79	27.54	12.3	12.4
Mascall Ranch, OR	MA6	15.69	1.80	1.60	0.60	0.60	20.76	13.1	12.7
Mascall Ranch, OR	MA4	15.70	2.01	1.51	0.65	0.79	22.74	12.8	12.3
Picture Gorge, OR	JODA9106	15.92	2.53	4.76	1.01	1.39	44.20	11.0	11.9
Picture Gorge, OR	JODA9119	15.98	2.18	2.56	1.28	0.69	30.71	12.0	11.6
Picture Gorge, OR	JODA9128	16.02	2.76	1.96	1.29	1.34	34.83	11.7	11.9
Bone Creek, OR	JODA8385	17.14	2.29	1.53	1.07	1.38	30.31	12.0	12.4
Bone Creek, OR	JODA8354	17.32	1.38	0.90	0.86	0.57	17.67	13.5	12.7
Bone Creek, OR	JODA8358	17.33	1.74	1.40	1.07	0.94	24.79	12.6	12.7
Bone Creek, OR	JODA8378	17.43	2.26	1.32	1.35	1.43	31.33	12.0	12.3
Bone Creek, OR	JODA8364	17.46	1.64	1.34	1.30	0.96	25.66	12.5	12.0
Bone Creek, OR	JODA8372	17.48	2.62	1.30	1.83	1.77	37.69	11.5	12.3
Kimberly, OR	JODA9074	17.85	1.64	1.39	0.94	0.71	22.06	12.9	12.1

Locality	Specimen	Age (Ma)	CaO	MgO	K ₂ O	Na ₂ O	PWI	MAT (°C)	MAT 3pt. Avg. (°C)
Kimberly, OR	JODA9072	18.07	2.70	1.30	1.45	1.28	32.42	11.9	12.2
Kimberly, OR	JODA9070	18.14	2.56	1.17	1.14	1.68	32.26	11.9	11.9
Kimberly, OR	JODA9069	18.44	2.30	1.52	1.09	1.30	29.89	12.1	11.8
Kimberly, OR	JODA9067	18.55	2.67	1.68	1.16	1.85	36.04	11.6	11.7
Kimberly, OR	JODA9066	18.70	2.56	1.19	1.62	1.95	37.00	11.5	11.4
Kimberly, OR	JODA9065	19.02	3.17	1.11	1.86	2.03	40.85	11.2	11.4
Kimberly, OR	JODA9064	19.25	2.45	1.27	1.75	1.96	37.76	11.4	11.3
Kimberly, OR	JODA9063	19.47	2.56	1.36	1.86	2.25	41.14	11.2	11.3
Kimberly, OR	JODA9088	19.61	2.82	1.31	1.75	2.06	39.95	11.3	11.2
Kimberly, OR	JODA9087	19.84	3.09	1.19	1.99	2.23	43.01	11.1	11.2
Kimberly, OR	JODA9086	20.07	2.88	1.22	1.89	2.29	42.18	11.1	11.0
Spray, OR	JODA9084	20.50	2.42	2.62	1.63	2.92	49.01	10.7	10.9
Spray, OR	JODA9083	20.78	2.51	1.84	1.66	3.11	47.59	10.8	10.8
Spray, OR	JODA9082	20.99	2.99	1.83	1.74	2.75	47.33	10.8	10.9
Spray, OR	JODA9081	21.17	2.07	1.70	1.72	2.97	44.81	11.0	10.9
Spray, OR	JODA9080	21.40	3.13	1.82	1.48	3.15	48.98	10.7	10.9
Spray, OR	JODA9079	21.61	2.32	1.96	1.65	2.68	44.41	11.0	10.8
Spray, OR	JODA9078	21.87	2.67	1.29	1.47	3.59	48.04	10.8	10.8
Spray, OR	JODA9077	22.16	2.17	0.95	2.42	3.95	52.84	10.5	10.7
Spray, OR	JODA9076	22.40	2.16	0.86	2.16	3.38	47.04	10.9	10.7
Spray, OR	JODA9075	22.58	3.15	0.79	1.66	3.43	47.77	10.8	11.0
Kimberly, OR	JODA9192	22.82	2.86	1.33	1.74	1.88	38.90	11.4	11.2
Kimberly, OR	JODA9191	23.02	2.68	1.56	1.61	1.70	37.21	11.5	11.3
Kimberly, OR	JODA9190	23.27	3.05	1.24	1.83	2.21	41.99	11.2	11.3
Kimberly, OR	JODA9189	23.56	3.21	1.59	1.35	2.25	41.47	11.2	11.2
Bone Creek, OR	JODA8398	23.68	3.28	1.71	1.46	1.97	40.97	11.2	11.2
Bone Creek, OR	JODA8402	23.69	3.31	1.65	1.48	1.88	40.34	11.3	11.3
Bone Creek, OR	JODA8394	23.80	3.01	2.23	1.09	1.65	37.78	11.4	11.3
Bone Creek, OR	JODA8393	23.97	3.48	2.12	1.16	1.81	40.54	11.3	11.4
Bone Creek, OR	JODA8392	24.16	2.84	2.11	1.09	1.67	36.80	11.5	11.4
Bone Creek, OR	JODA8391	24.32	3.11	1.92	0.99	1.99	38.58	11.4	11.2
RF, Longview Ranch, OR	JODA8423	24.71	3.17	1.62	2.51	2.47	49.76	10.7	10.9
RF, Longview Ranch, OR	JODA8422	24.96	3.43	1.73	1.81	2.78	49.14	10.7	10.7
RF, Longview Ranch, OR	JODA8421	25.24	3.72	1.88	1.90	2.74	51.08	10.6	10.7
RF, Longview Ranch, OR	JODA8419	25.72	3.05	1.45	1.82	3.05	48.49	10.8	10.7
RF, Longview Ranch, OR	JODA8418	26.05	3.84	1.79	1.52	2.85	49.66	10.7	10.8
RF, Longview Ranch, OR	JODA8417	26.06	3.50	1.61	1.42	2.99	48.04	10.8	10.7
RF, Longview Ranch, OR	JODA8416	26.37	3.67	1.74	1.76	3.12	52.07	10.6	10.7
RF, Longview Ranch, OR	JODA8415	26.69	3.18	1.14	1.87	3.22	49.14	10.7	10.7
RF, Longview Ranch, OR	JODA8409	27.15	3.86	1.83	1.52	2.82	49.69	10.7	10.7
RF, Longview Ranch, OR	JODA8408	27.51	3.54	1.91	2.06	2.69	51.15	10.6	10.7
Longview Ranch airport, OR	JODA8431	27.77	2.91	1.43	2.29	2.75	48.63	10.8	10.7
Longview Ranch airport, OR	JODA8429	27.97	2.83	1.27	1.77	3.26	48.07	10.8	10.8
Longview Ranch airport, OR	JODA8428	28.13	3.41	1.48	1.53	2.82	46.67	10.9	10.8
Longview Ranch airport, OR	JODA8427	28.33	3.15	1.65	2.17	2.72	49.50	10.7	10.8
Longview Ranch airport, OR	JODA8426	28.54	2.98	1.52	2.10	2.91	49.22	10.7	10.9
Painted Hills, OR	JODA5619	28.77	2.92	1.37	2.00	1.66	39.33	11.3	11.2
Painted Hills, OR	JODA5623	28.79	2.89	1.25	2.06	1.56	38.40	11.4	11.3
Painted Hills, OR	JODA5609	29.07	2.85	1.21	2.30	1.68	40.31	11.3	11.4
Painted Hills, OR	JODA5602	29.24	2.75	0.81	1.92	1.80	36.88	11.5	11.5
Painted Hills, OR	JODA5586	29.62	2.25	0.66	2.04	1.61	33.85	11.7	11.3
Painted Hills, OR	JODA5668	30.05	2.74	1.32	2.43	2.92	49.53	10.7	11.3
Painted Hills, OR	JODA5551	30.51	2.55	1.13	2.06	1.87	38.76	11.4	11.3
Painted Hills, OR	JODA5536	30.78	2.97	1.07	0.77	1.71	31.38	11.9	11.8
Painted Hills, OR	JODA5531	30.89	2.54	1.25	0.75	1.64	29.96	12.1	12.0
Painted Hills, OR	JODA5505	31.06	2.68	1.38	0.70	1.84	32.06	11.9	12.0
Painted Hills, OR	JODA5472	31.15	2.64	1.20	0.79	1.84	31.71	11.9	11.8
Painted Hills, OR	JODA5442	31.27	3.65	0.96	0.48	2.04	33.94	11.7	12.0
Painted Hills, OR	JODA5437	31.28	2.32	0.87	0.91	1.44	27.17	12.3	11.9
Painted Hills, OR	JODA5416	31.44	3.67	0.83	0.92	2.10	36.47	11.5	11.6
Painted Hills, OR	JODA5392	31.60	0.95	0.63	6.20	0.45	45.58	10.9	11.6
Clarno, OR	JODA5121	31.85	2.11	0.62	0.92	1.51	25.91	12.5	11.8
Painted Hills, OR	JODA5367	31.90	2.56	0.92	1.33	1.69	32.42	11.9	12.2
Painted Hills, OR	JODA5694	32.25	2.52	0.59	0.71	1.92	28.83	12.2	12.1
Painted Hills, OR	JODA5692	32.26	2.49	0.57	0.83	1.87	29.00	12.2	12.1
Painted Hills, OR	JODA5681	32.26	2.66	0.50	0.86	1.88	29.58	12.1	12.1
Painted Hills, OR	JODA5350	32.28	2.49	0.56	0.85	2.04	30.23	12.0	13.2

Locality	Specimen	Age (Ma)	CaO	MgO	K ₂ O	Na ₂ O	PWI	MAT (°C)	MAT 3pt. Avg. (°C)
Painted Hills, OR	JODA5713	32.28	0.70	0.26	0.26	0.47	8.34	15.5	13.1
Painted Hills, OR	JODA5717	32.28	2.98	0.63	1.40	1.75	33.58	11.8	13.2
Painted Hills, OR	JODA5691	32.28	2.26	0.70	0.69	1.70	26.72	12.4	12.3
Painted Hills, OR	JODA5688	32.32	2.09	0.79	0.71	1.35	24.22	12.6	12.6
Painted Hills, OR	JODA5685	32.33	1.68	1.02	1.33	0.89	24.19	12.6	12.5
Painted Hills, OR	JODA5684	32.34	2.36	0.88	0.62	1.68	27.28	12.3	12.4
Painted Hills, OR	JODA5682	32.36	2.48	0.86	0.84	1.75	29.41	12.1	12.2
Painted Hills, OR	JODA5279	32.92	2.49	0.56	1.15	1.80	30.37	12.0	12.2
Painted Hills, OR	JODA5267	33.01	2.70	0.45	1.06	1.37	27.24	12.3	12.5
Painted Hills, OR	JODA5218	33.48	1.68	0.35	1.15	0.94	20.72	13.1	12.7
Painted Hills, OR	JODA5203	33.52	2.42	0.75	0.83	0.98	23.46	12.7	13.1
Painted Hills, OR	JODA5200	33.55	1.08	0.47	1.14	0.69	17.26	13.6	13.7
Painted Hills, OR	JODA5175	33.65	0.89	0.17	0.31	0.77	10.99	14.8	14.4
Painted Hills, OR	JODA5170	33.68	1.03	0.14	0.61	0.34	10.23	15.0	15.0
Painted Hills, OR	JODA5166	33.69	0.85	0.13	0.60	0.37	9.68	15.1	15.0
Painted Hills, OR	JODA5163	33.71	1.09	0.26	0.62	0.34	11.01	14.8	14.7
Painted Hills, OR	JODA5157	33.72	1.32	0.69	0.36	0.57	13.65	14.2	14.3
Painted Hills, OR	JODA5139	34.18	1.75	1.44	0.10	0.40	15.62	13.8	14.3
Painted Hills, OR	JODA5147	34.23	0.96	0.35	0.17	0.74	10.96	14.8	14.6
Painted Hills, OR	JODA5658	34.32	0.98	0.00	0.29	0.55	9.02	15.3	15.5
Painted Hills, OR	JODA5652	34.35	0.73	0.00	0.20	0.31	5.95	16.4	15.7
Painted Hills, OR	JODA5642	34.40	1.15	0.00	0.27	0.39	8.42	15.5	15.2
Clarno, OR	JODA5048	40.00	1.63	1.12	0.49	0.52	16.98	13.6	14.2
Clarno, OR	JODA5105	40.50	2.13	0.52	0.63	0.61	17.77	13.5	13.4
Clarno, OR	JODA4195	41.71	1.44	0.82	0.98	0.82	19.96	13.2	13.6
Clarno, OR	JODA4161	42.45	1.08	0.02	0.69	0.75	13.17	14.3	13.3
Clarno, OR	JODA5064	44.95	0.90	1.33	0.70	1.90	25.76	12.5	13.1
Clarno, OR	JODA5057	45.00	0.76	1.33	0.63	1.92	24.97	12.6	-

Note: Age and Major Element Data from Retallack (2007)