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# Quality Characteristics of the Lower Elkhorn Coal Bed in Eastern Kentucky

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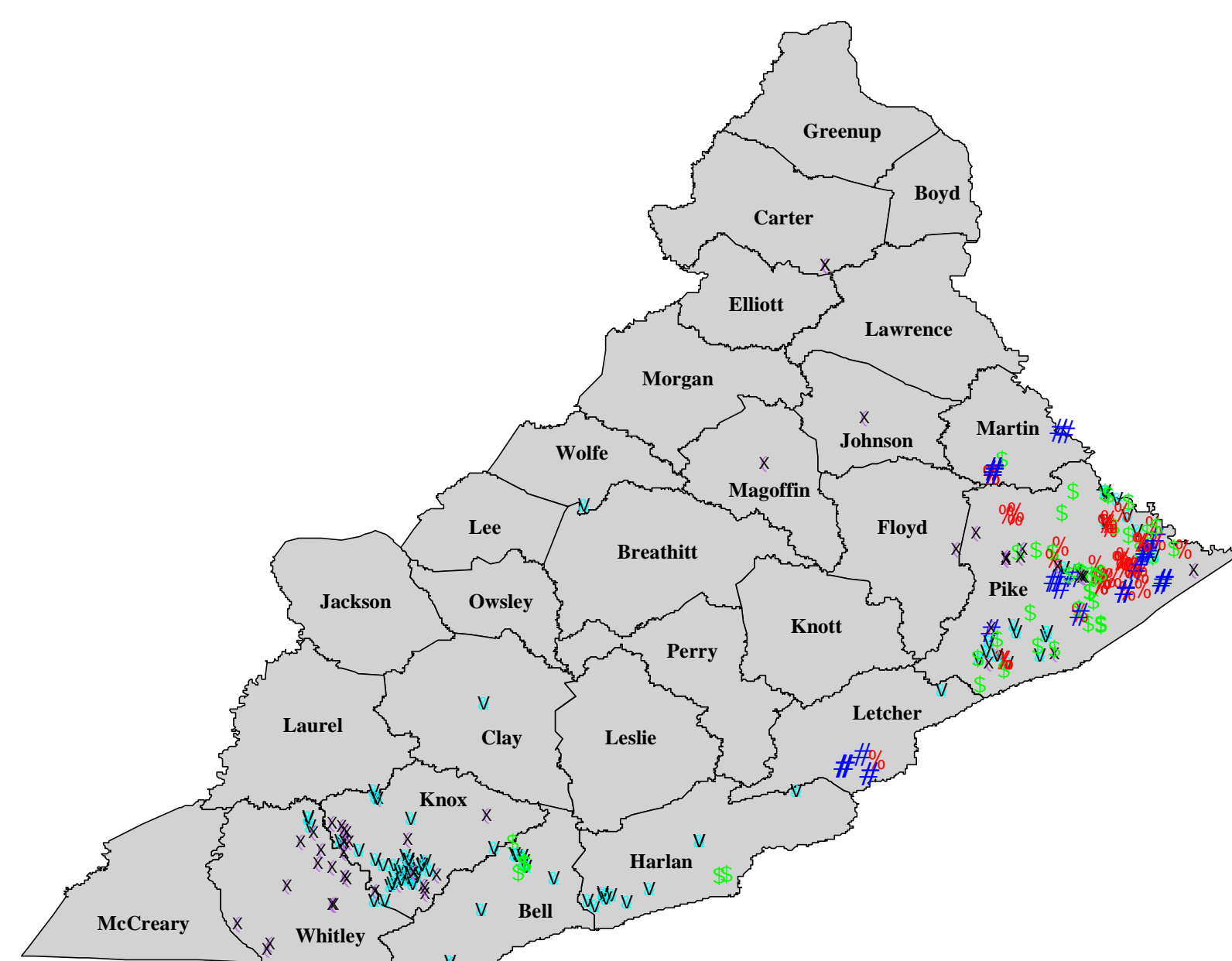
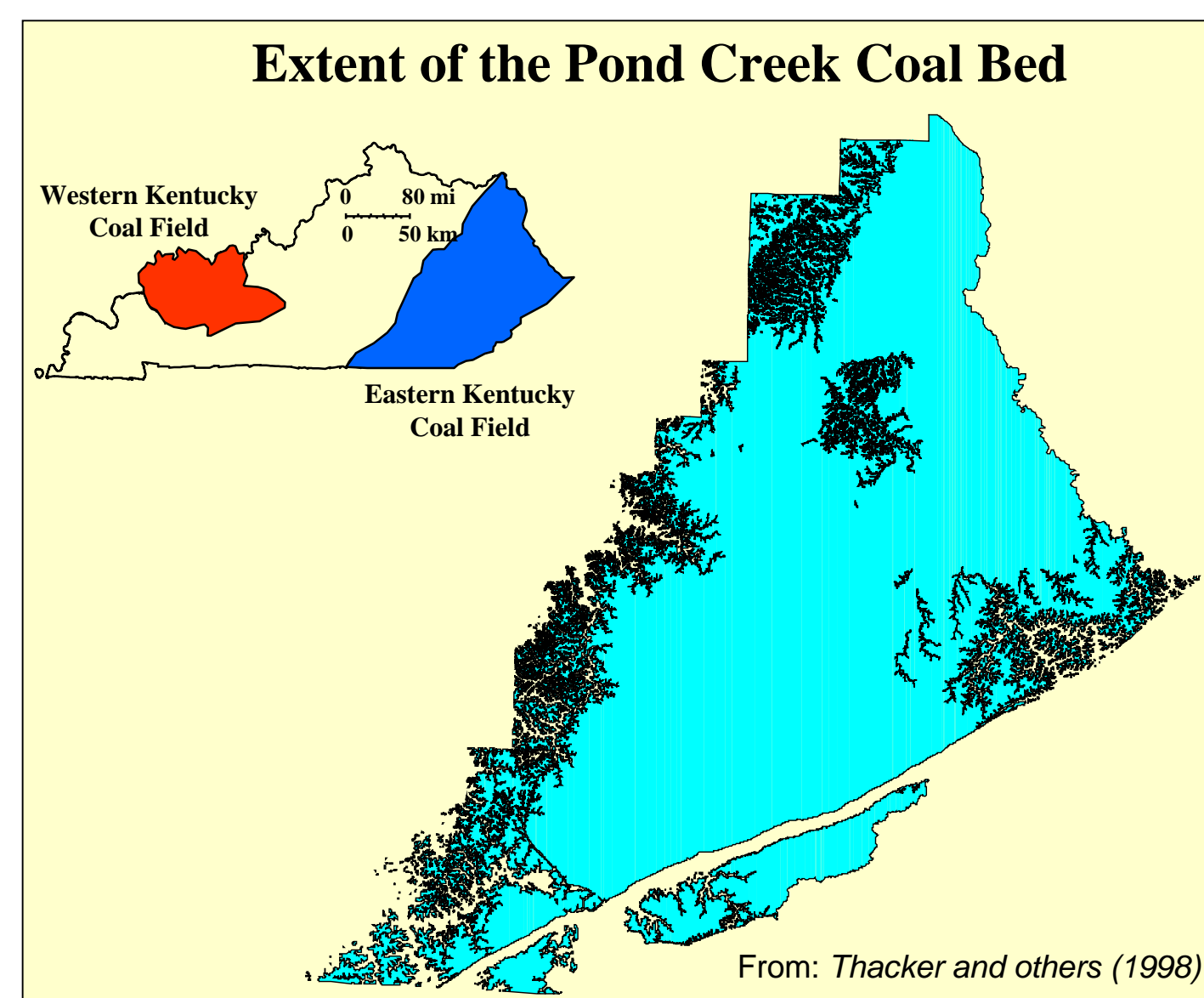
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# Quality Characteristics of the Lower Elkhorn Coal Bed in Eastern Kentucky

Cortland F. Eble

Thickness and quality data from the Kentucky Coal Resources Information System (KCRIS) are summarized in this chart for the Lower Elkhorn coal bed (and equivalents). Parameter averages and ranges of values are presented in the two tables, and average values are displayed graphically by county.

The Lower Elkhorn is one of the most heavily mined coal beds in the Eastern Kentucky Coal Field; more than 17,000 tons were mined in 1997, according to the Energy Information Administration. The Lower Elkhorn, which occurs within the Pikeville Formation of the Breathitt Group, is also one of the thickest and most laterally extensive coal beds in eastern Kentucky, averaging 55 inches in thickness where sampled in Pike and Martin Counties (mainly in and adjacent to active mines). In other counties where the Lower Elkhorn is mined, it averages 39 inches in total bed thickness. The Lower Elkhorn coal bed is characteristically low in ash and sulfur (avg. 7.5 percent and 1.2 percent, respectively), which historically has made it an attractive target for both steam and metallurgical applications. The low sulfur content renders it a "compliance coal" in many instances, meaning that when burned, it emits less than 1.2 pounds of sulfur dioxide (SO<sub>2</sub>) for every million Btu generated.

The Environmental Protection Agency is currently interested in the amount of mercury and chlorine in coal that is burned by electric utilities. KCRIS data indicate the mercury content of the Lower Elkhorn coal varies between 0.01 and 0.57 parts per million (ppm, whole coal basis). Chlorine contents vary between 100 and 3,700 ppm.

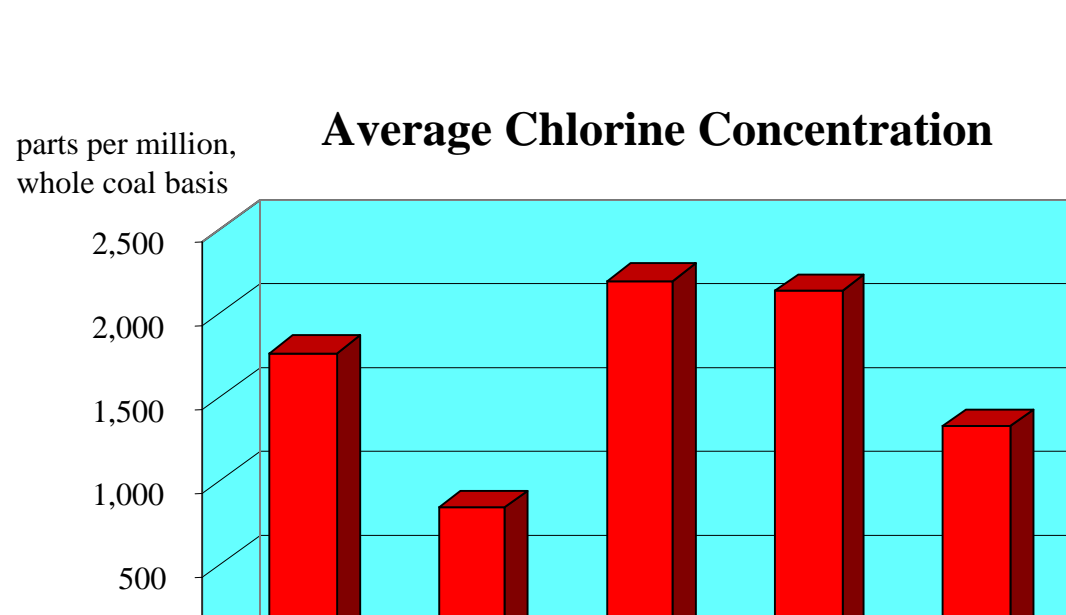
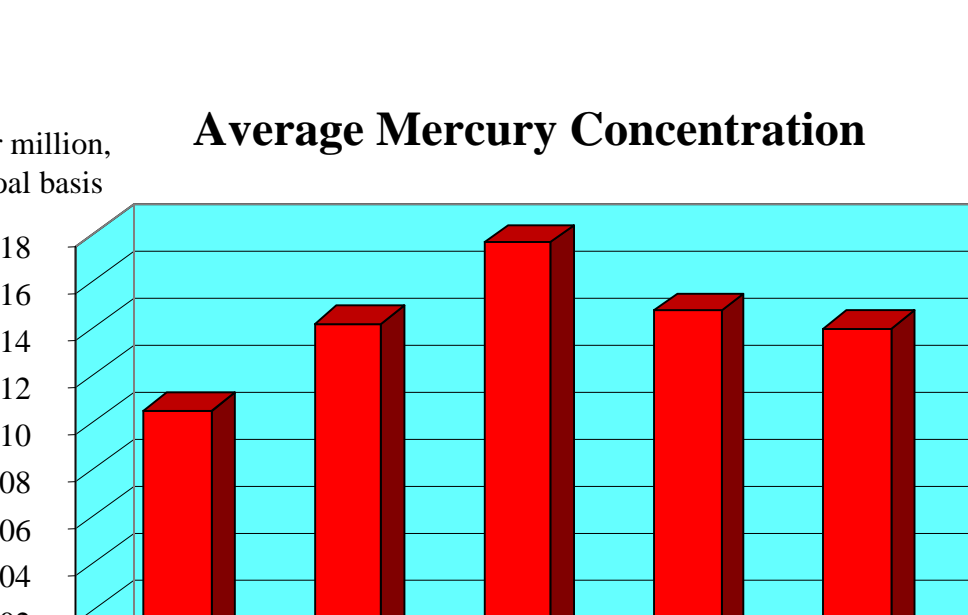
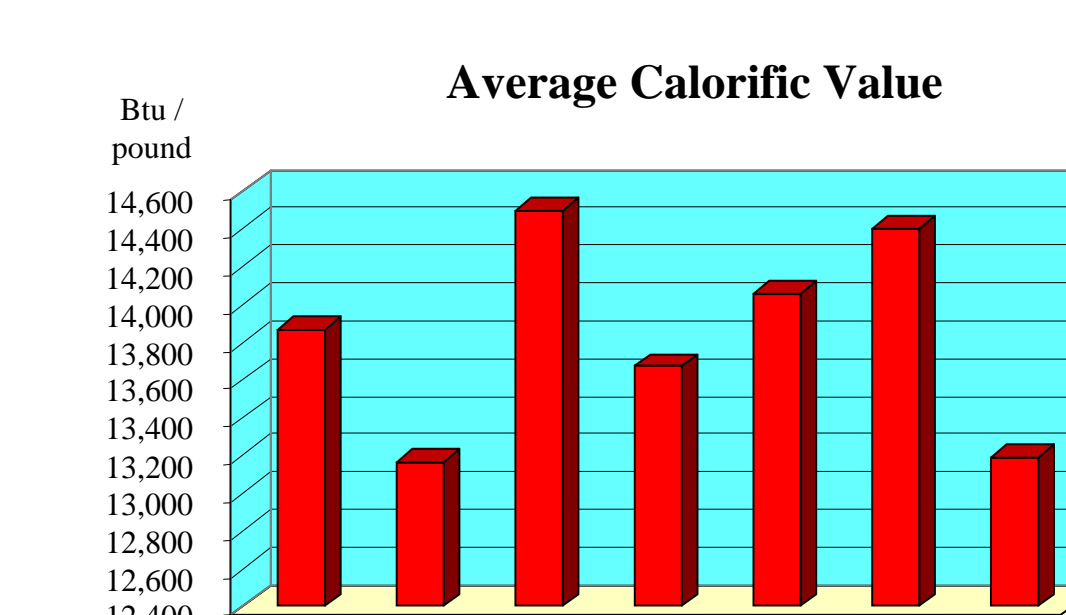
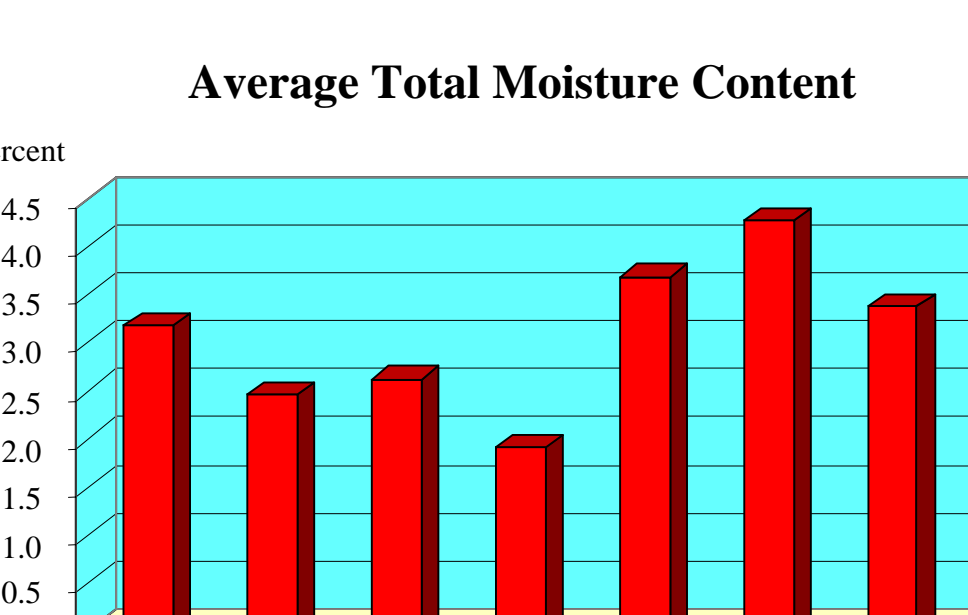
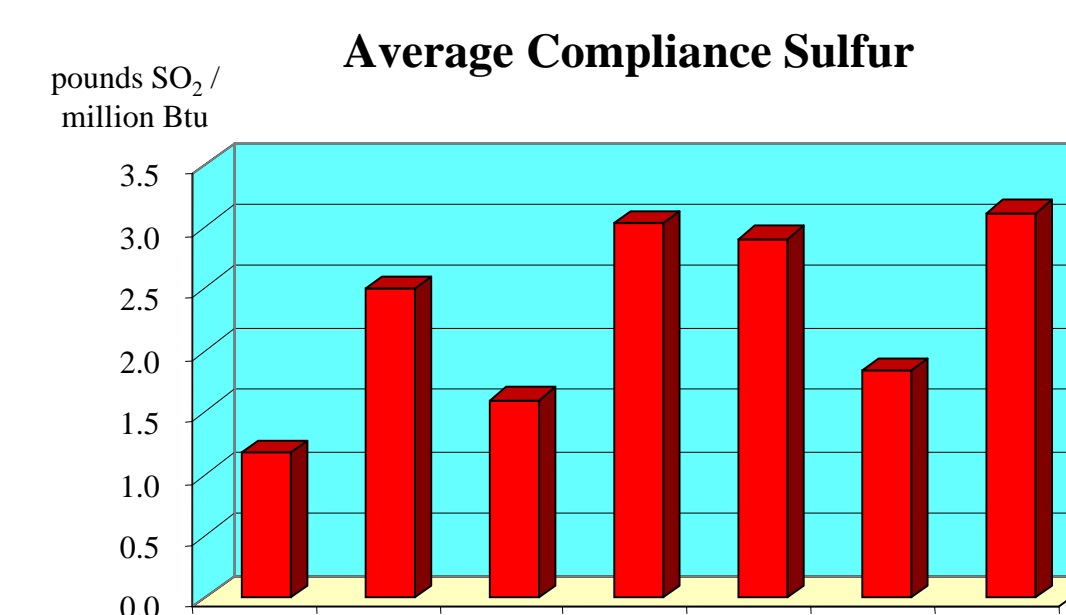
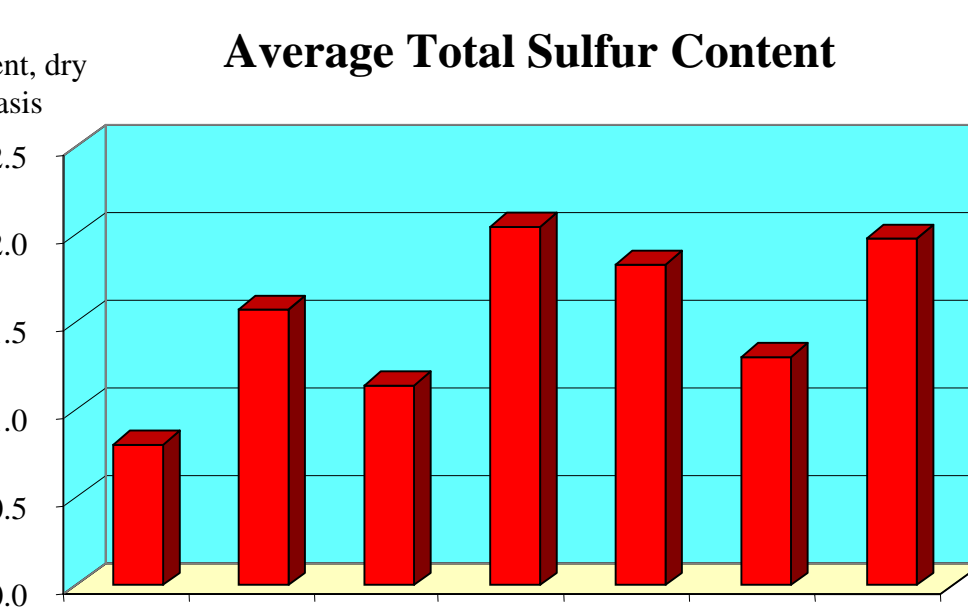
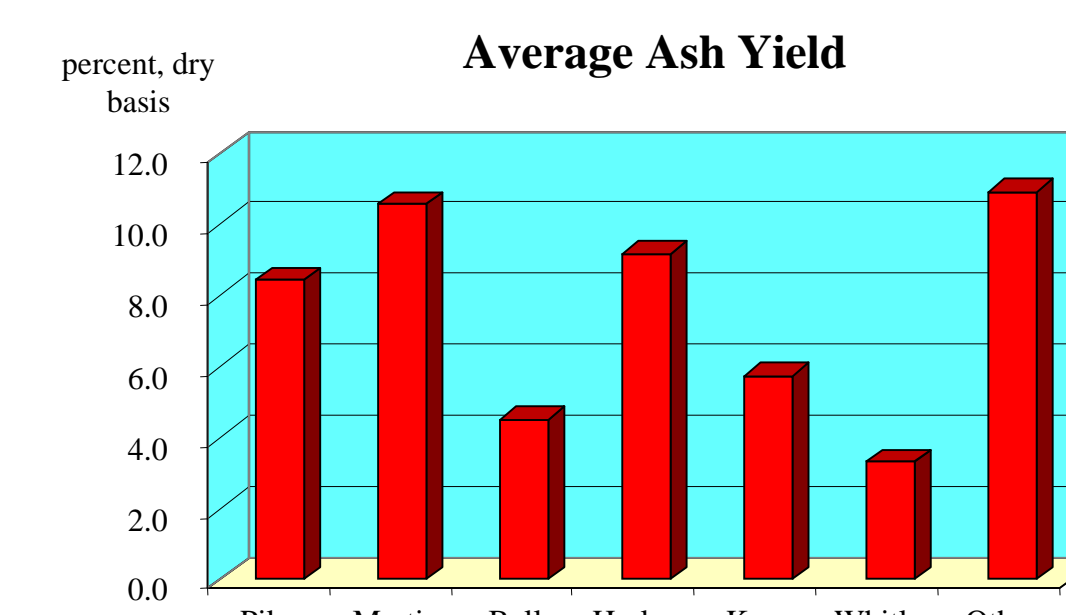
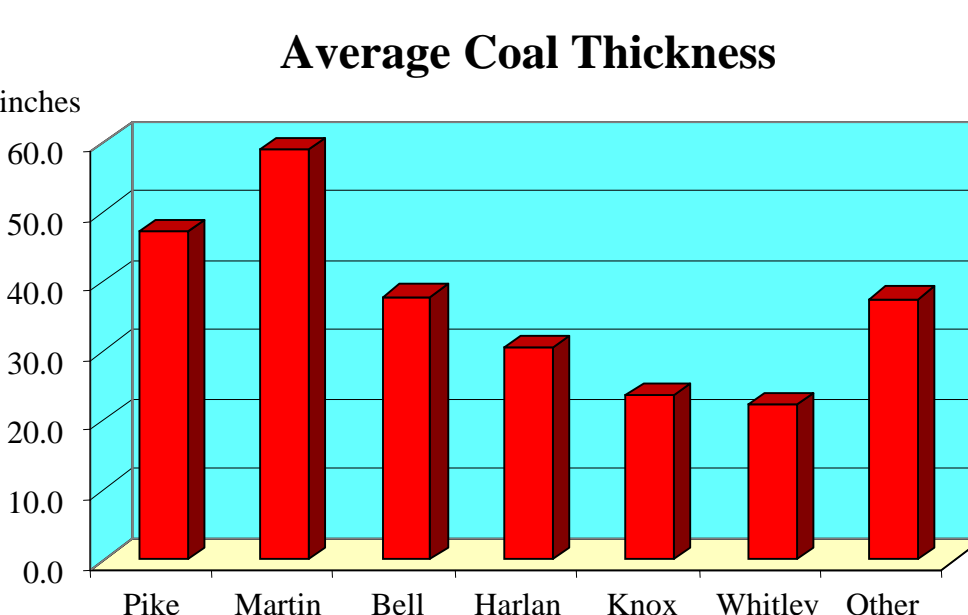
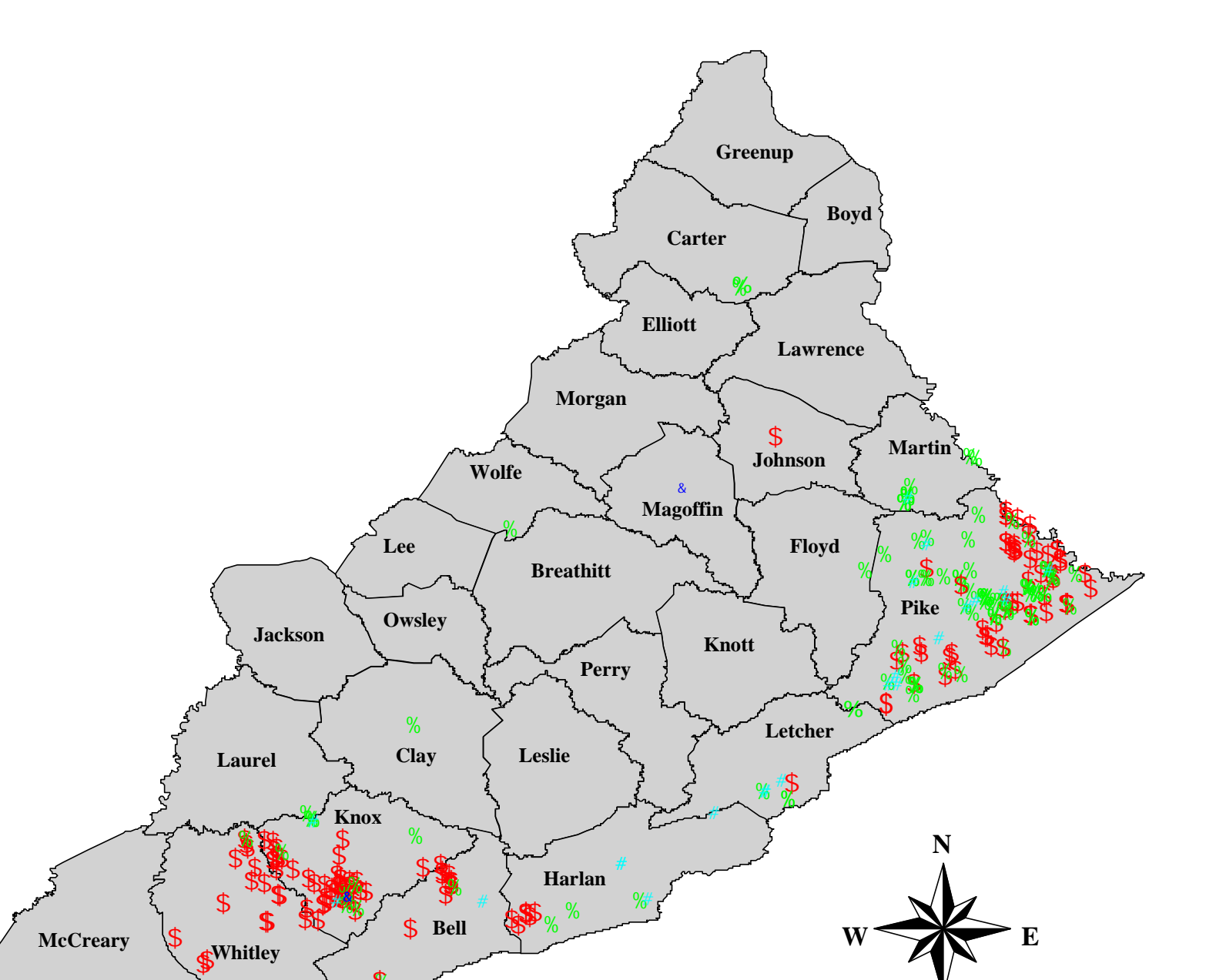
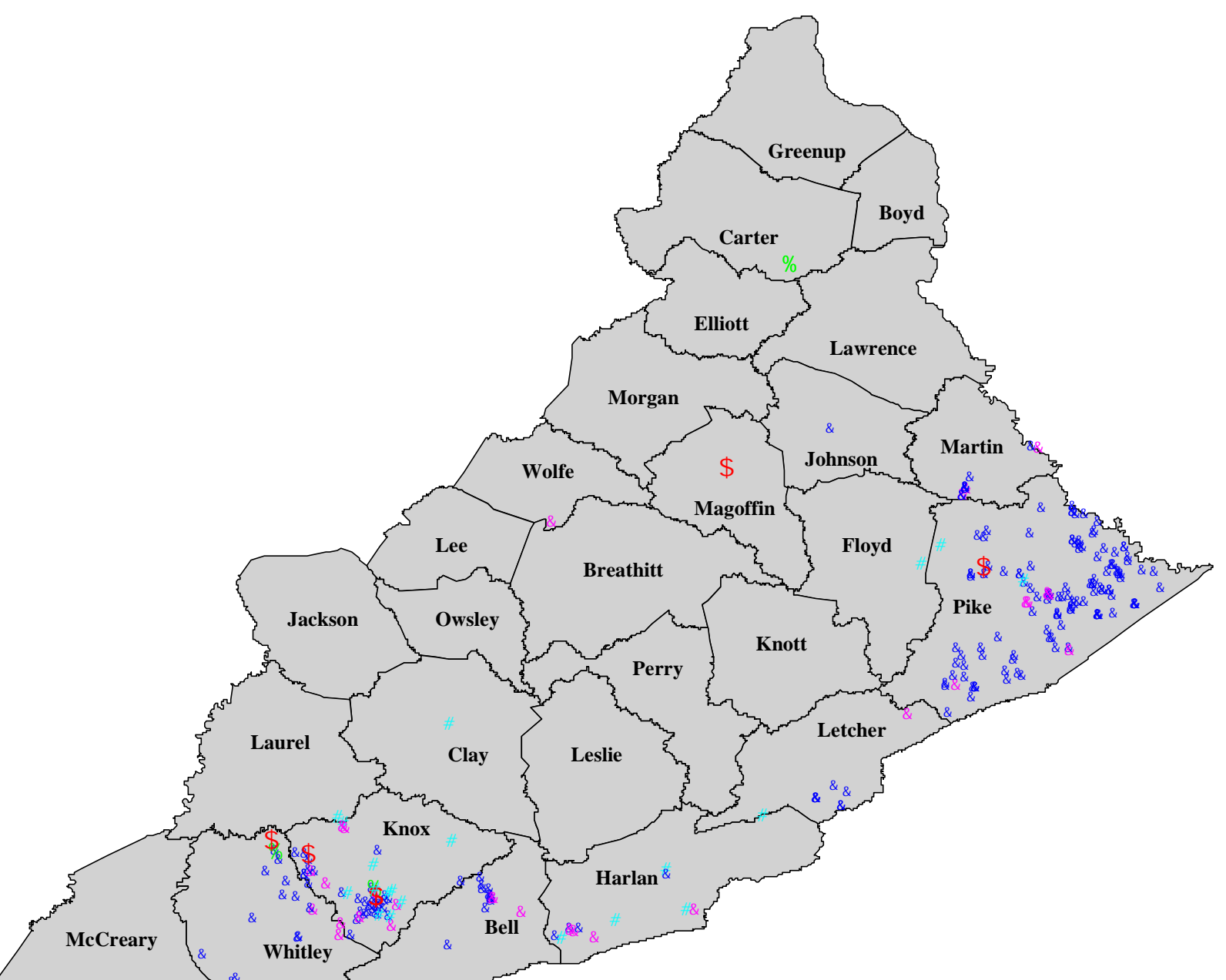
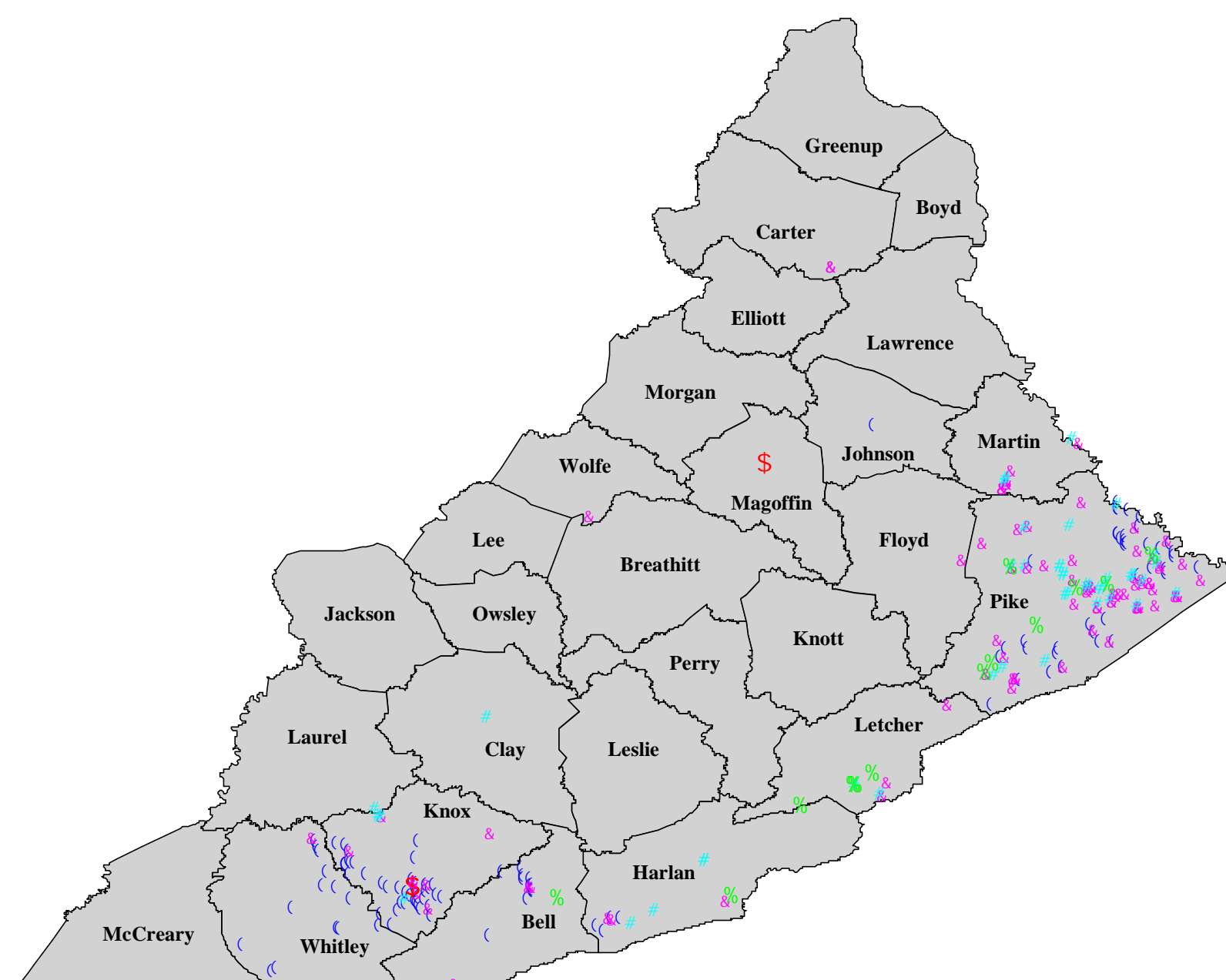
### References Cited

Thacker, E.E., Weisenfluh, G.A., and Andrews, W.M., Jr., 1998, Total coal thickness of the Lower Elkhorn coal in eastern Kentucky: Kentucky Geological Survey, series 11, Map and Chart Series 20, 1 sheet.

### Acknowledgments

The author wishes to acknowledge the assistance of Drew Andrews, Jerry Weisenfluh, and Steve Greb in the preparation of this report.

Western Europe Stage	Mid-continent USA Series	North American Series	Eastern Kentucky Group	Eastern Kentucky Formation	Major Coal Beds and Coal Zones
Westphalian D	Desmoinesian	Princess	Princess	Princess	Princess No. 9
					Princess No. 8
Bolsovian	Atokan	Middle Pennsylvanian	Breathitt	Four Corners	Princess No. 7
					Princess No. 6
Duckmantian	Atokan	Middle Pennsylvanian	Breathitt	Hyden	Princess No. 5a, 5b
					Stoney Fork Member
Langsettian	Morrowan	Lower	Grundy	Pikeville	Broas
					Lower Elkhorn



County	Coal Thickness	Total Moisture	Ash Yield	Total Sulfur	Calorific Value	Compliance Sulfur
<b>Pike</b>						
Average	47.3	3.2	8.4	0.8	13,869	1.2
Maximum	131.6	7.7	18.1	5.2	15,051	7.7
Minimum	14.4	1.2	1.6	0.4	12,215	0.6
Count	134	78	134	134	134	134
<b>Martin</b>						
Average	62.1	2.1	9.3	1.3	13,367	1.9
Maximum	73.8	2.2	12.6	1.8	13,696	2.7
Minimum	46.9	1.9	7.4	0.6	12,866	0.8
Count	12	3	12	12	12	12
<b>Bell</b>						
Average	37.9	2.6	4.5	1.1	14,499	1.6
Maximum	45.7	4.6	15.8	2.5	15,082	3.6
Minimum	30.7	1.5	1.2	0.7	12,593	0.9
Count	15	14	15	15	15	15
<b>Harlan</b>						
Average	30.5	1.9	9.2	2.0	13,672	3.0
Maximum	43.0	2.5	18.3	3.2	14,840	5.1
Minimum	20.5	1.3	2.9	0.6	12,141	0.9
Count	14	6	14	14	14	14
<b>Knox</b>						
Average	23.7	3.7	5.7	1.8	14,057	2.9
Maximum	33.0	6.4	11.8	3.2	14,916	22.0
Minimum	14.0	1.7	1.1	0.5	7,970	0.7
Count	58	18	58	58	58	58
<b>Whitley</b>						
Average	22.3	4.3	3.3	1.3	14,404	1.8
Maximum	26.5	7.3	6.5	4.8	14,955	6.9
Minimum	14.2	2.2	1.0	0.6	13,878	0.8
Count	18	11	18	18	18	18
<b>Other</b>						
Average	37.5	3.4	10.9	2.0	13,194	3.1
Maximum	74.0	7.6	25.0	5.4	14,602	10.0
Minimum	15.6	1.1	1.8	0.7	10,779	1.0
Count	16	12	16	16	16	16

	As	Be	Cd	Cl	Co	Cr	Hg	Mn	Ni	Pb	P	Sb	Se	Th	U
<b>Pike/Martin</b>															
Average	12.5	2.7	0.0	1,764.7	4.1	17.5	0.1	39.7	12.1	6.5	48.5	1.0	4.3	2.5	1.2
Maximum	110.0	6.9	0.1	3,700.0	16.0	33.8	0.3	249.1	42.9	12.0	120.0	2.1	6.6	4.0	2.2
Minimum	0.7	0.7	0.0	500.0	1.0	4.1	0.0	3.0	4.0	1.9	44.0	0.2	2.3	0.4	0.3
Count	17	18	17	17	82	83	17	82	83	18	17	17	17	17	18
<b>Bell/Harlan</b>															
Average	11.4	1.4	0.1	840.0	3.6	13.4	0.1	22.5	7.4	5.6	265.8	0.6	3.6	2.5	1.1
Maximum	34.0	2.0	0.2	2,700.0	8.6	31.7	0.4	59.0	14.0	9.9	830.0	1.1	5.6	4.2	1.9
Minimum	2.0	0.5	0.0	100.0	1.2	3.1	0.0	3.8	3.1	1.4	44.0	0.3	1.6	0.6	0.2
Count	6	6	6	6	13	13	6	13	13	6	6	6	6	6	6
<b>Knox</b>															
Average	39.8	2.0	0.0	2,191.7	4.5	9.0	0.2	23.5	11.8	2.5	91.0	0.9	2.6	1.0	0.8
Maximum	110.0	3.7	0.1	3,100.0	11.0	24.1	0.6	100.0	23.8	10.0	420.0	2.0	3.4	4.9	3.0
Minimum	1.3	0.7	0.0	1,000.0	1.3	2.5	0.0	3.5	3.5	0.5	22.0	0.2	1.4	0.2	0.2
Count	12	12	12	12	28	30	12	30	30	12	12	12	12	12	12
<b>Whitley</b>															
Average	16.9	1.6	0.0	2,128.6	5.8	5.0	0.1	29.2	11.0	1.5	61.1	0.8	2.1	0.4	0.5
Maximum	40.0	2.2	0.1	2,600.0	11.0	8.1	0.5	210.0	19.9	2.0	87.0	1.1	3.6	0.5	1.0
Minimum	1.8	0.9	0.0	1,600.0	0.2	1.8	0.0	4.4	4.6	0.9	44.0	0.4	1.2	0.3	0.3
Count	7	7	7	7	12	14	7	14	14	7	7	7	7	7	7
<b>Other</b>															
Average	41.8	2.2	0.1	1,325.0	5.9	17.4	0.1	75.3	27.5	8.8	51.5	1.6	4.5	2.7	2.2
Maximum	63.0	3.7	0.4	2,100.0	13.9	47.7	0.2	673.6	105.5	11.0	70.0	2.4	6.7	4.0	3.6
Minimum	14.0	1.5	0.0	200.0	1.5	2.9	0.1	4.8	9.6	5.1	44.0	0.7	2.2	0.5	0.4
Count	4	6	4	4	13	13	4	13	13	6	4	4	4	4	6

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