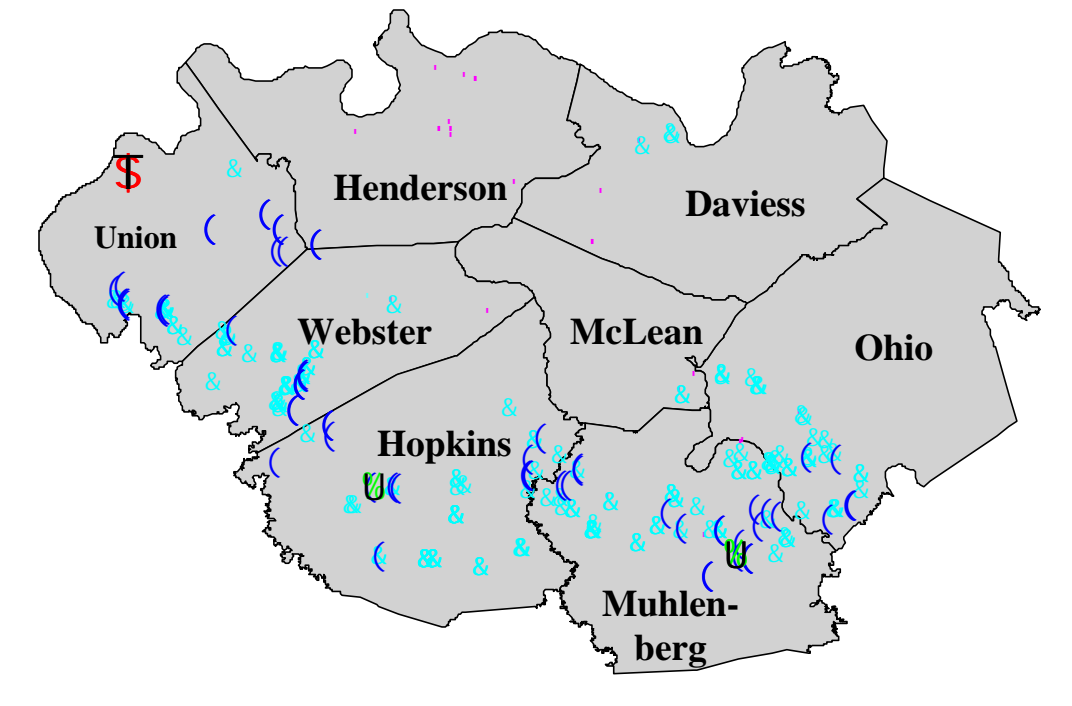
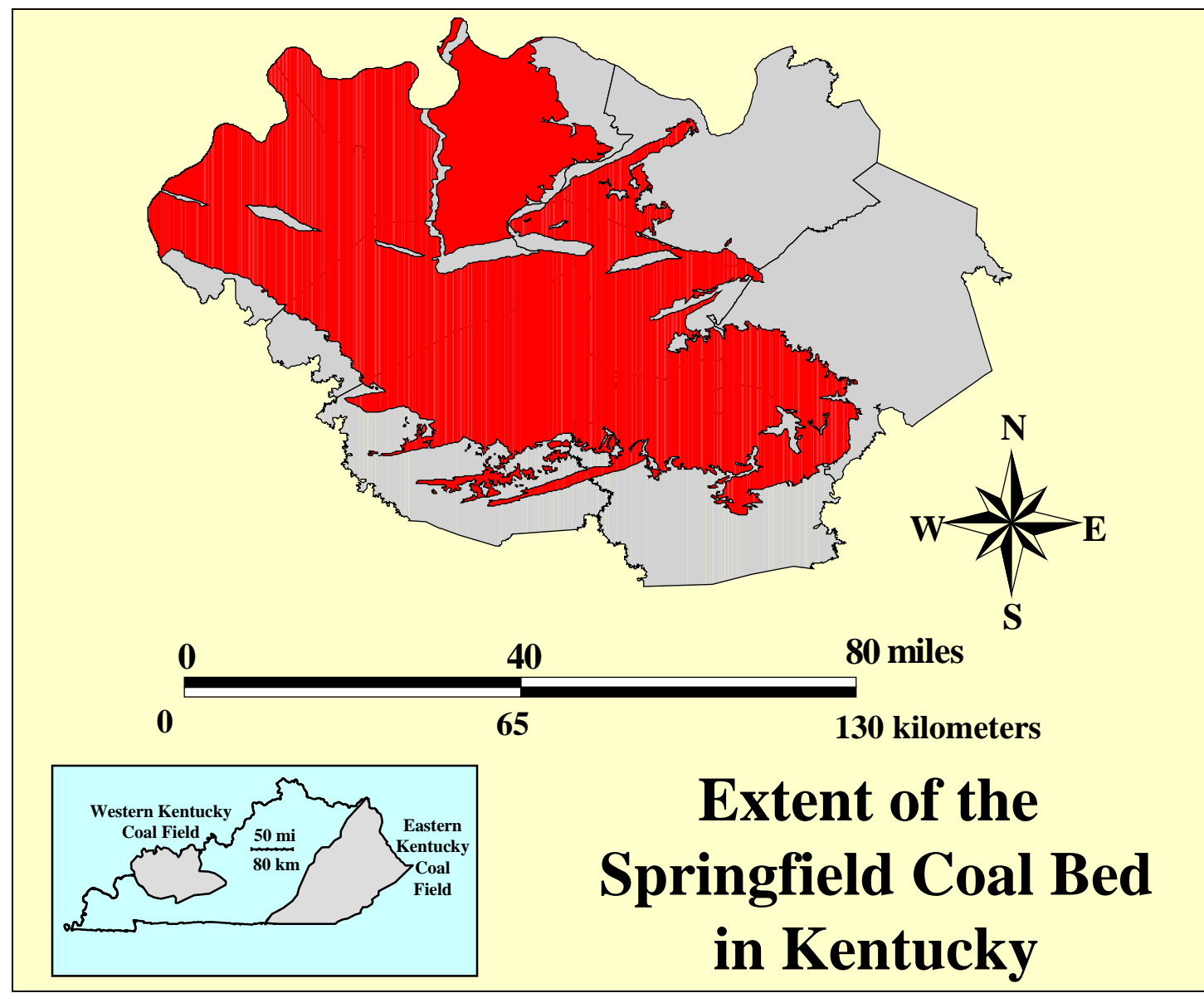
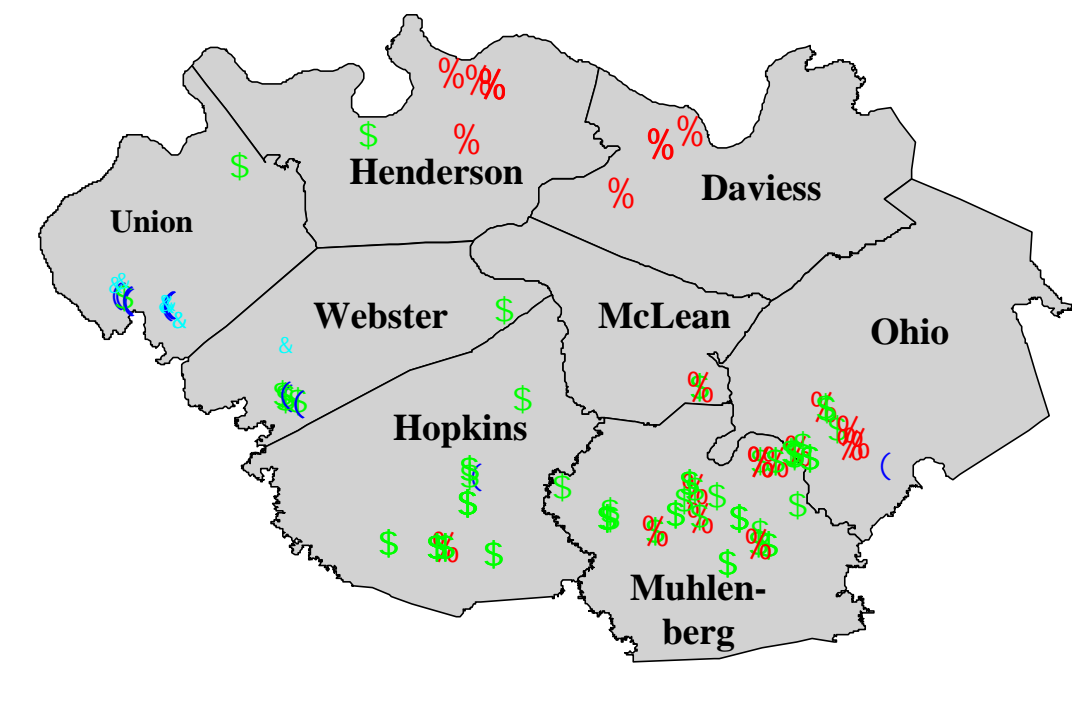


Quality Characteristics of the Springfield Coal in Western Kentucky

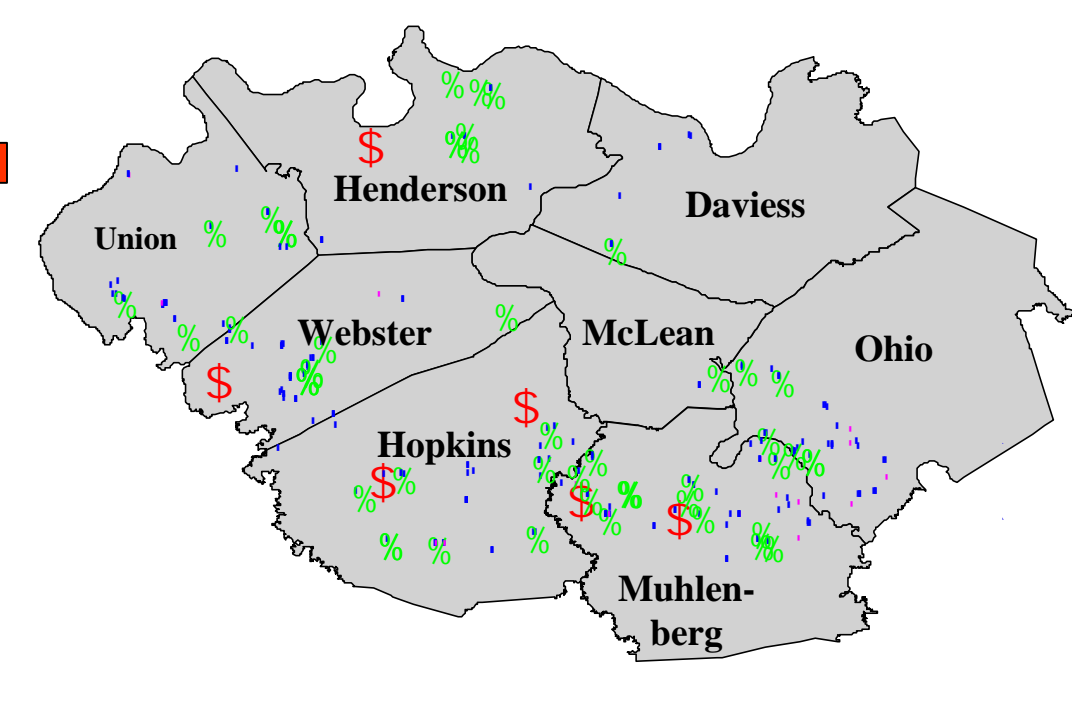
Cortland F. Eble



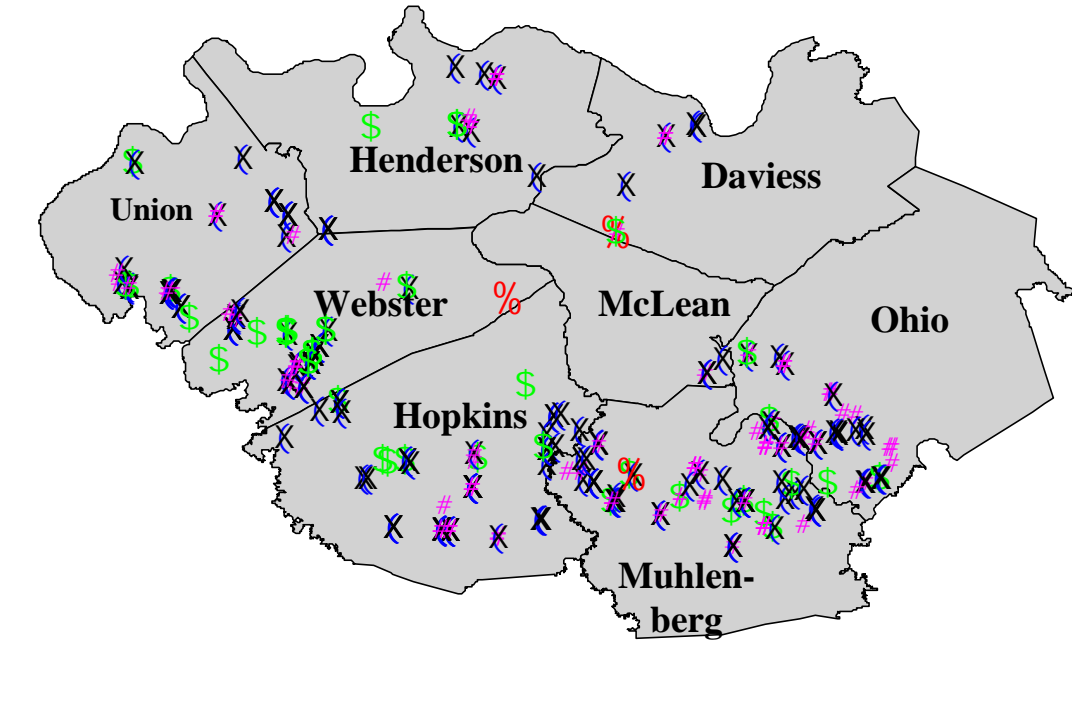
Total Coal Thickness (inches)
 30 to 48
 48 to 60
 60 to 72
 72 to 84
 84 to 150



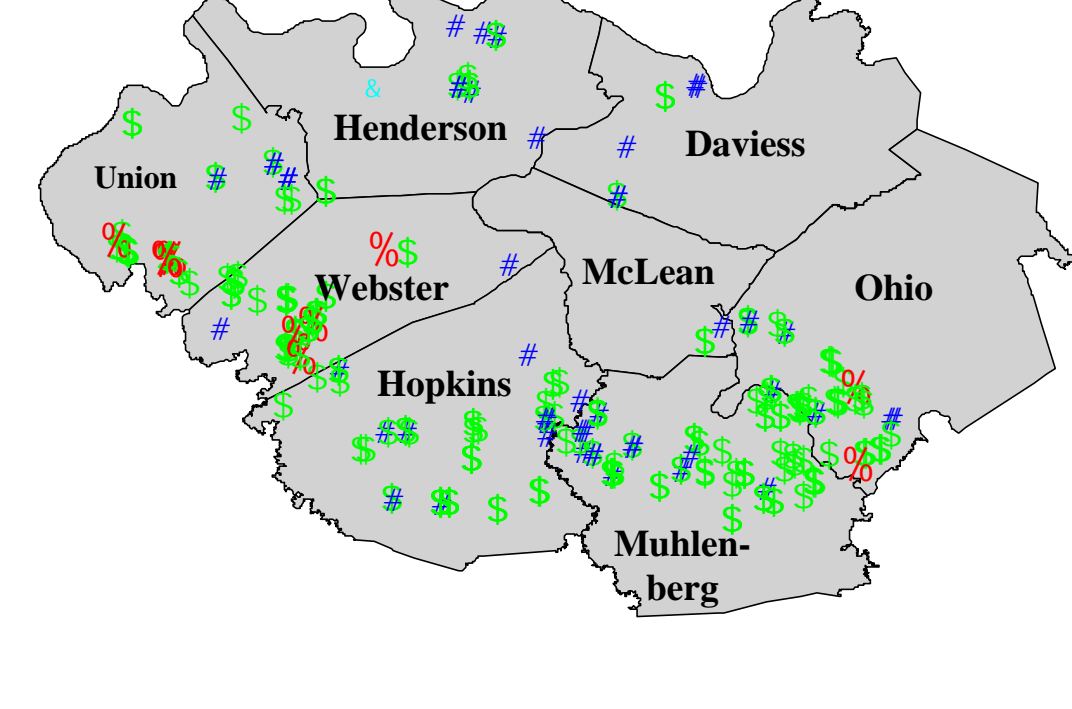
Total Moisture Content
 1 to 3
 3 to 5
 5 to 10
 10 to 15
 15 to 20



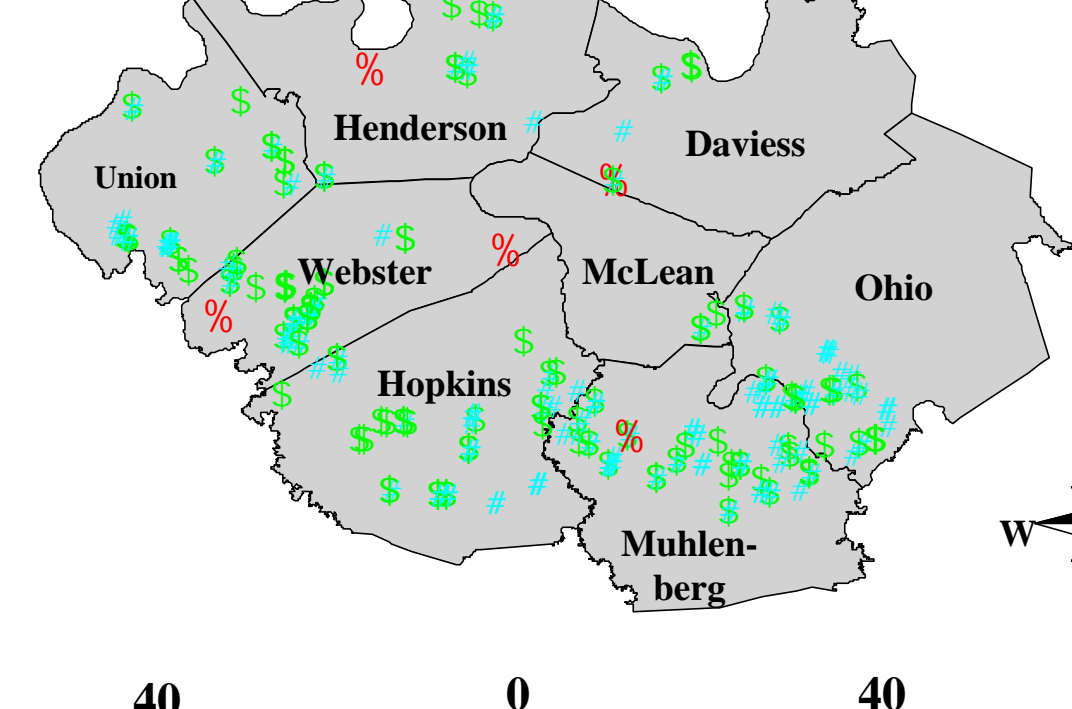
Ash Yield (dry basis)
 5 to 8
 8 to 12
 12 to 15
 15 to 20
 20 to 25



Total Sulfur Content (dry basis)
 1 to 3
 3 to 4
 4 to 6
 6 to 8
 8 to 10



Calorific Value, Btu/lb (dry basis)
 10,500 to 11,500
 11,500 to 12,500
 12,500 to 13,500
 13,500 to 14,500
 14,500 to 15,500



Compliance Sulfur (dry basis)
 1.5 to 3
 3 to 6
 6 to 10
 10 to 14
 14 to 18

Western Europe Stage	Series	Group	Formation
Westphalian D	Middle Pennsylvanian Series	McLeansboro Gp.	Shelburn Fm
			Coiltown (W. Ky. 14)
		Carbondale Formation	Baker (W. Ky. No. 13)
			Herrin (W. Ky. No. 11)
			Springfield (W. Ky. No. 9)
			Colchester (W. Ky. No. 8)
Duckmantian	Raccoon Creek Group	Tradewater Formation	Dekoven (W. Ky. No. 7)
			Davis (W. Ky. No. 6)
			Bancroft (W. Ky. No. 5)
			Mannington (W. Ky. No. 4)
			Elm Lick zone
			Dunbar
Bolshevik	Caseyville Formation	Caseyville Formation	Ice House (W. Ky. No. 3)
			Amos/Foster zone
			Hawesville
Langsettian	Caseyville Formation	Caseyville Formation	Battery Rock, Main Nolin

County	Total Coal	Total Parting	Total Moisture	Ash Yield	Volatile Matter	Fixed Carbon	Total Sulfur	Calorific Value	Compliance Sulfur
Webster	Average 56.8	0.1	4.8	11.1	38.1	50.8	4.3	13,167	6.5
Union	Average 66.6	0.1	3.7	11.0	38.5	50.5	3.9	13,006	6.0
Ohio	Average 55.9	0.0	9.3	10.4	41.1	48.5	3.6	12,877	5.6
Muhlenberg	Average 58.6	0.0	8.8	11.1	39.5	49.4	3.7	12,794	5.9
Hopkins	Average 58.5	0.1	8.3	10.9	39.8	49.3	3.9	12,801	6.0
Henderson	Average 48.7	0.1	10.5	12.3	39.7	48.0	3.9	12,416	6.3
Other	Average 50.4	0.2	11.6	10.6	39.6	49.8	3.6	12,695	5.7

County	As	Be	Cd	Ct	Co	Cr	Hg	Mn	Ni	Pb
Webster	Average 20.00	1.10	0.55	1,900.00	3.06	19.06	0.06	30.98	13.69	8.50
Ohio	Average 2.60	2.61	0.23	220.00	3.69	12.53	0.02	48.48	11.68	2.04
Muhlenberg	Average 5.05	2.29	0.17	ND	3.42	19.93	0.02	34.30	10.25	2.90
Hopkins	Average 7.97	1.31	0.35	1,900.00	3.50	16.34	0.02	55.75	10.27	8.00
Other	Average 11.47	1.80	0.49	183.33	3.81	16.70	0.06	57.13	12.12	7.87

County	P	Sb	Se	Th	U
Webster	Average 180.00	2.00	6.30	1.40	7.00
Ohio	Average 44.00	0.60	1.97	1.52	1.80
Muhlenberg	Average ND	0.80	2.19	1.54	2.41
Hopkins	Average 66.00	1.82	2.74	1.21	3.80
Other	Average 96.00	1.43	2.90	1.53	3.45

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

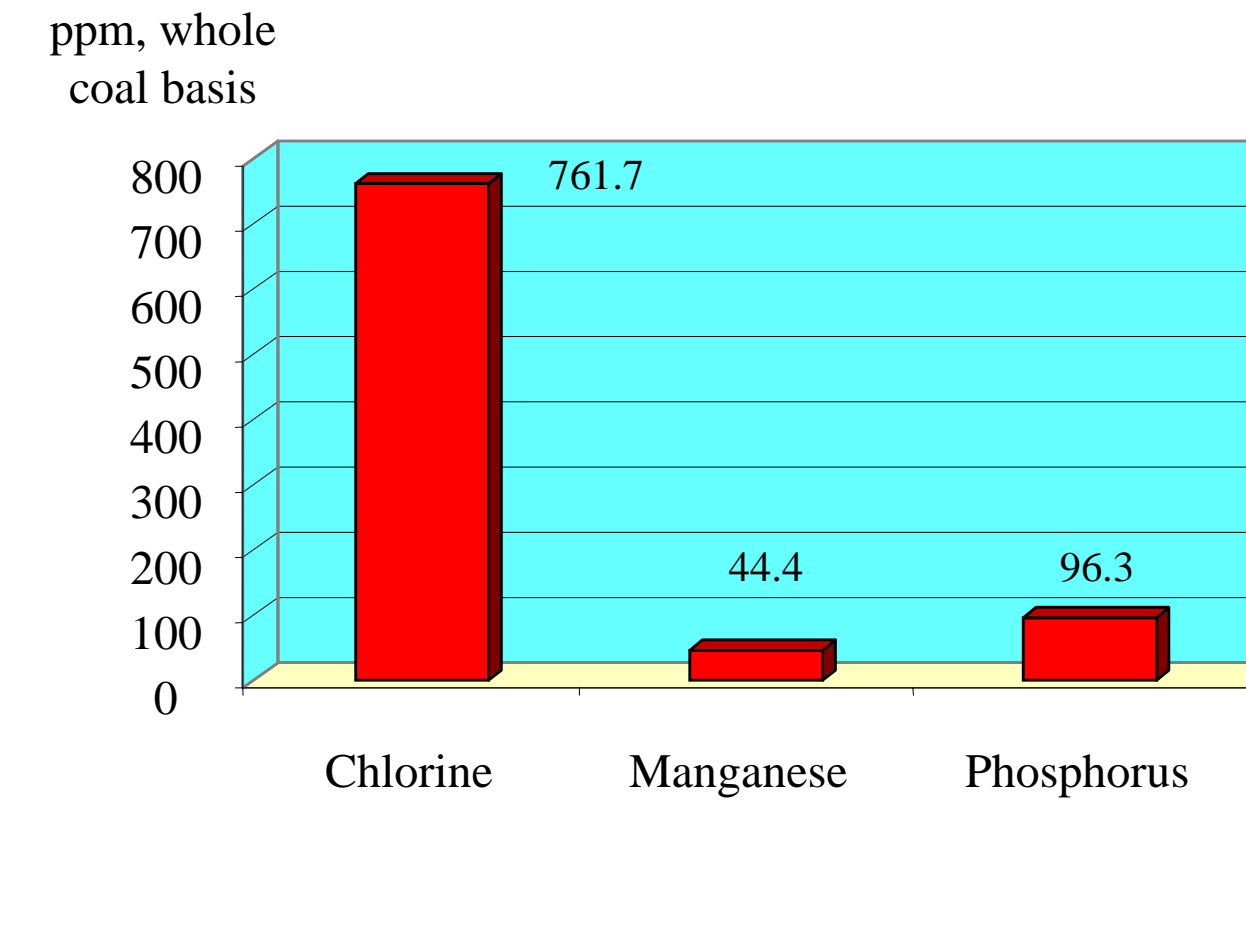
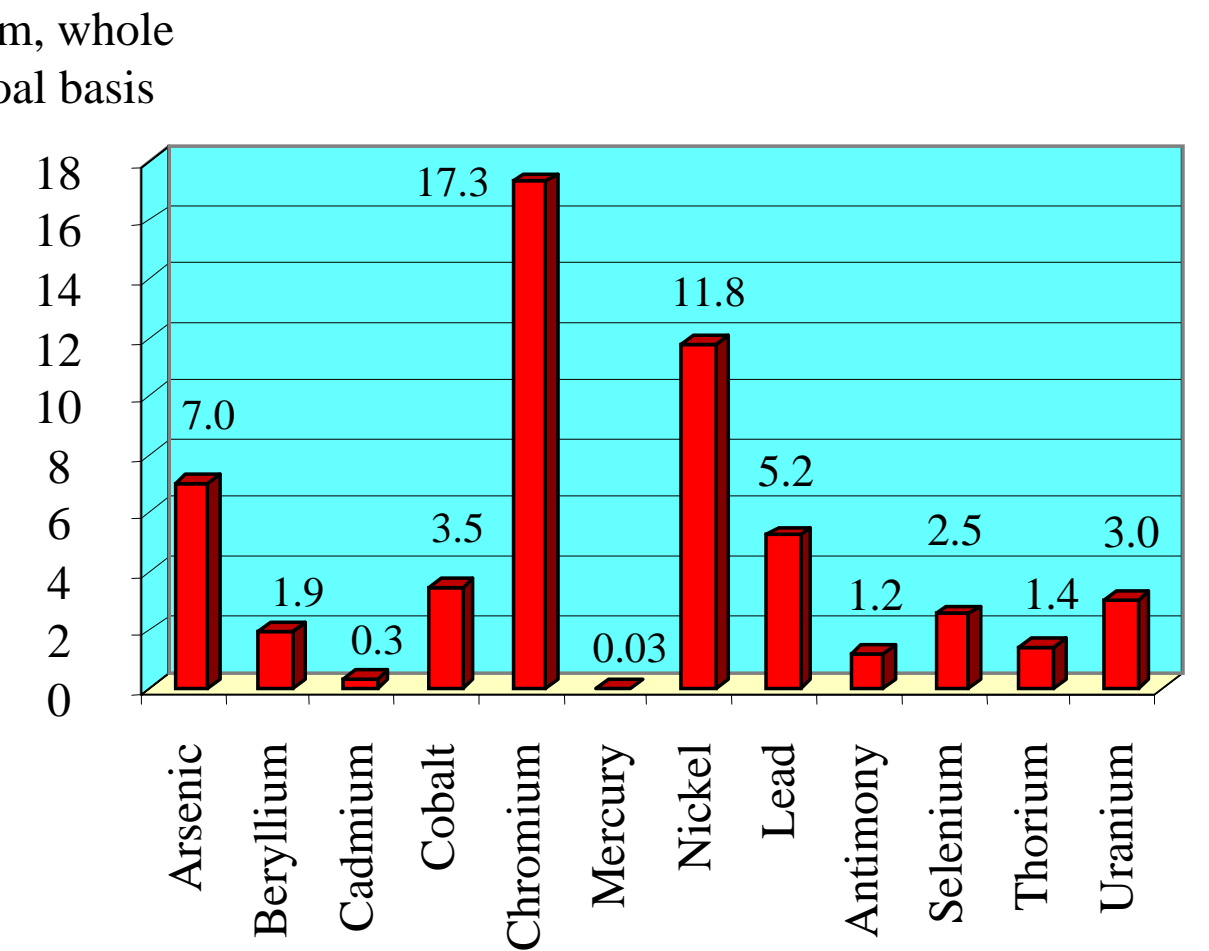
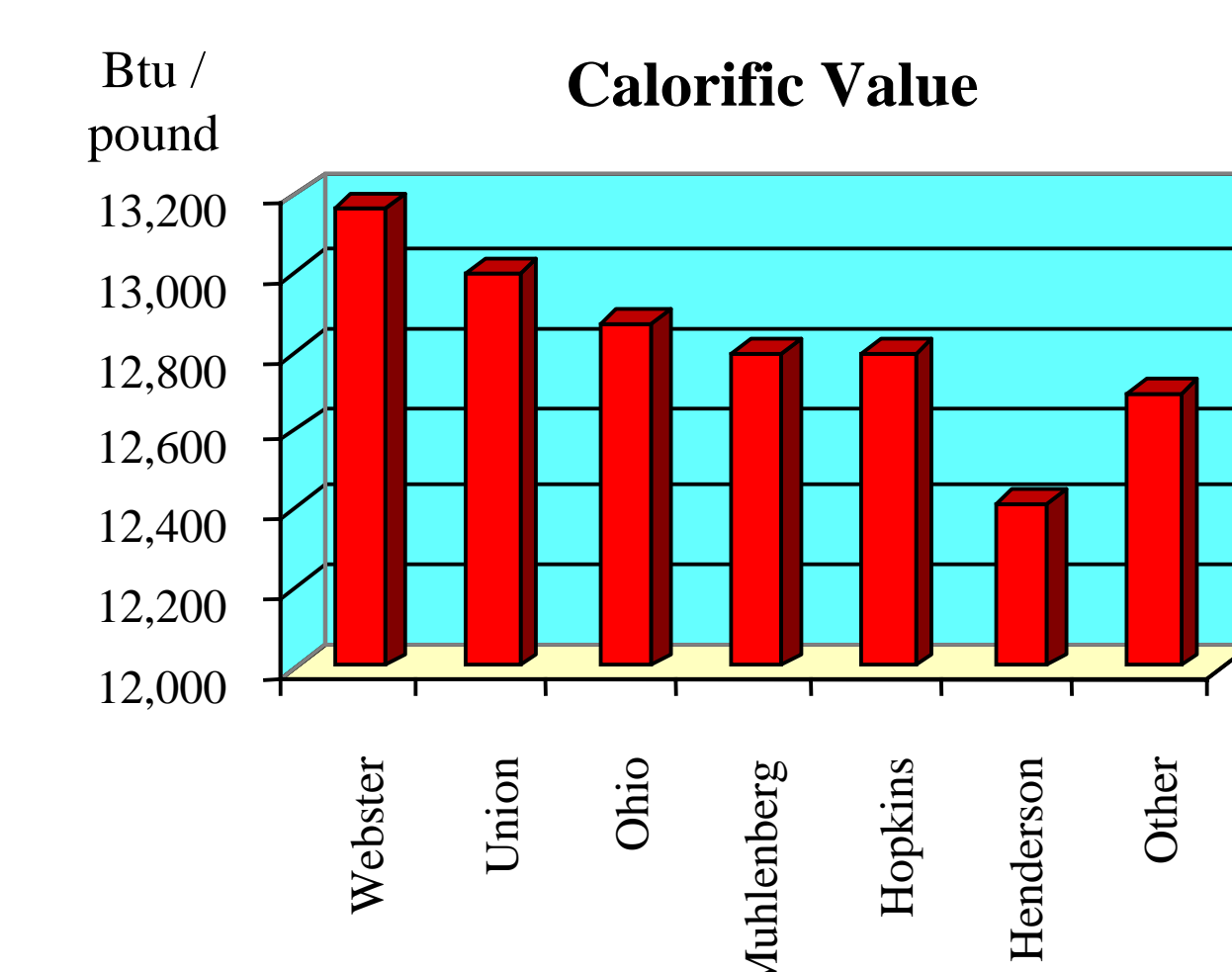
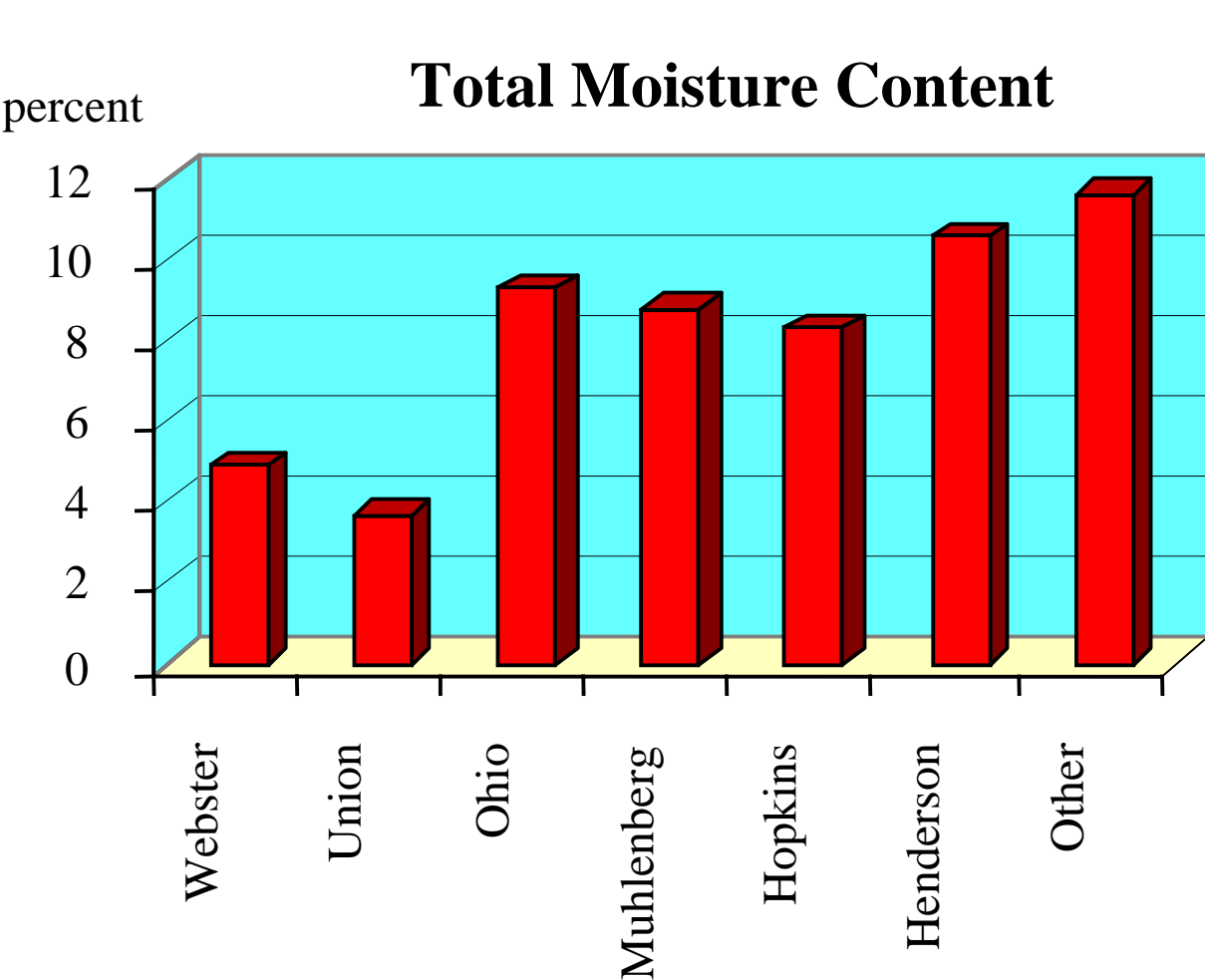
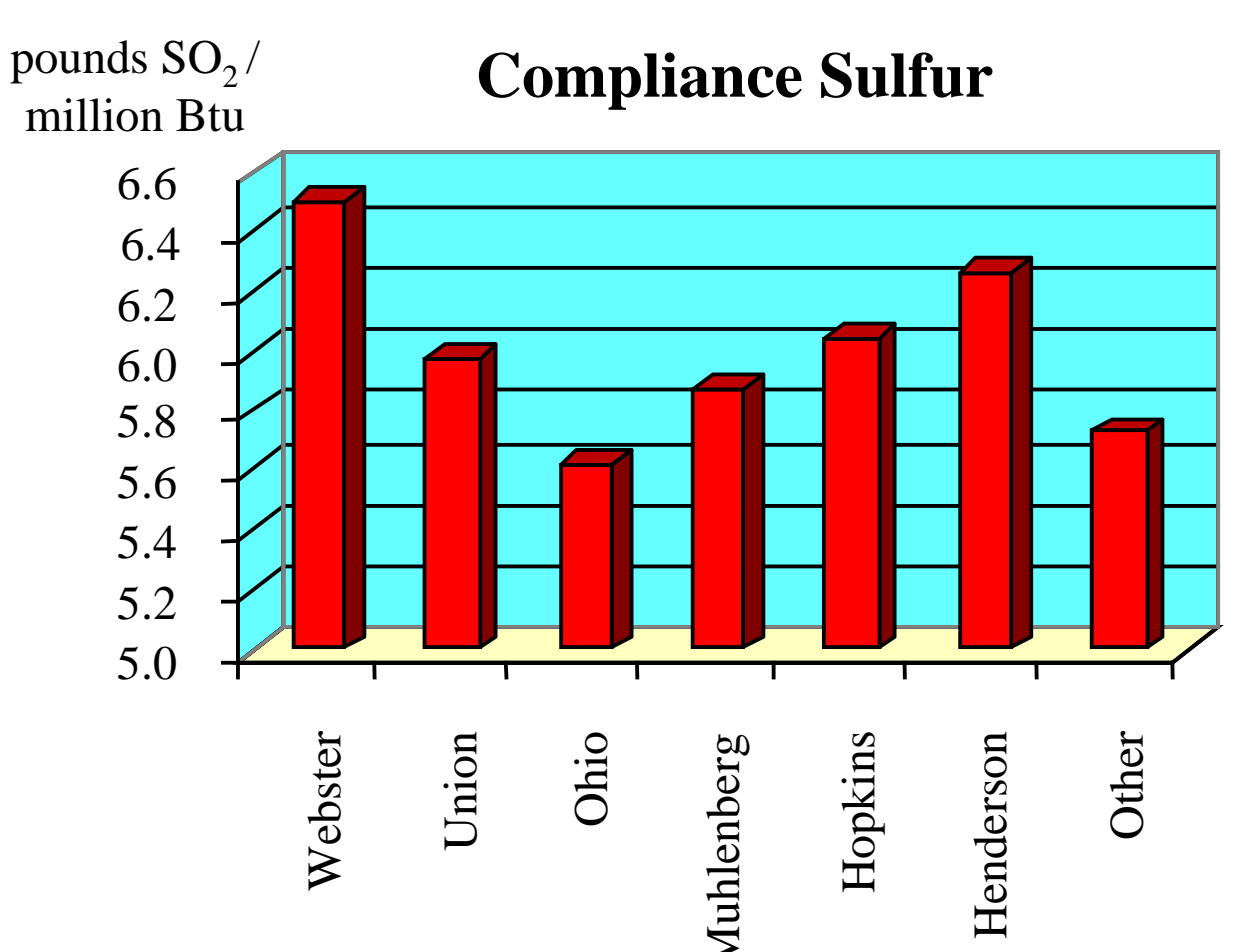
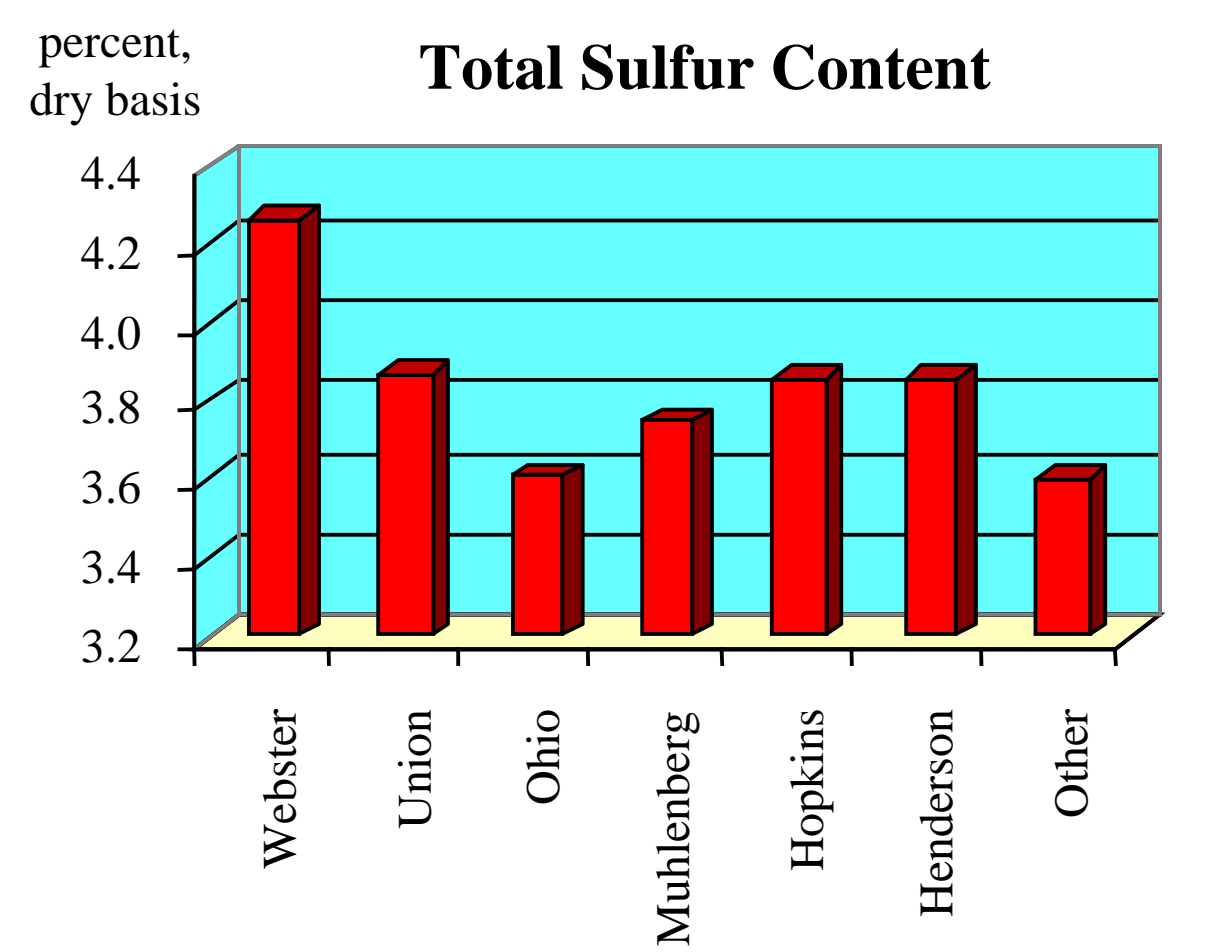
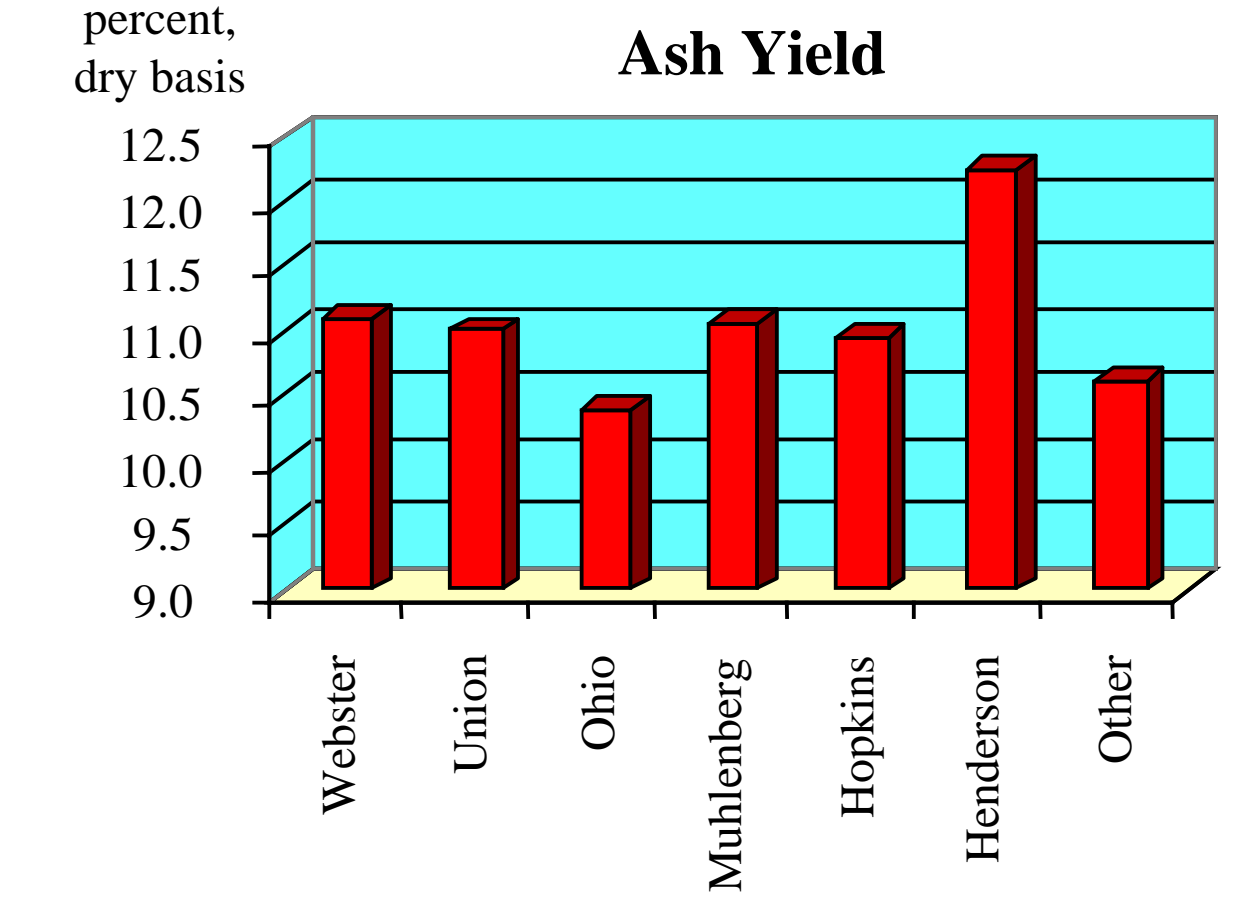
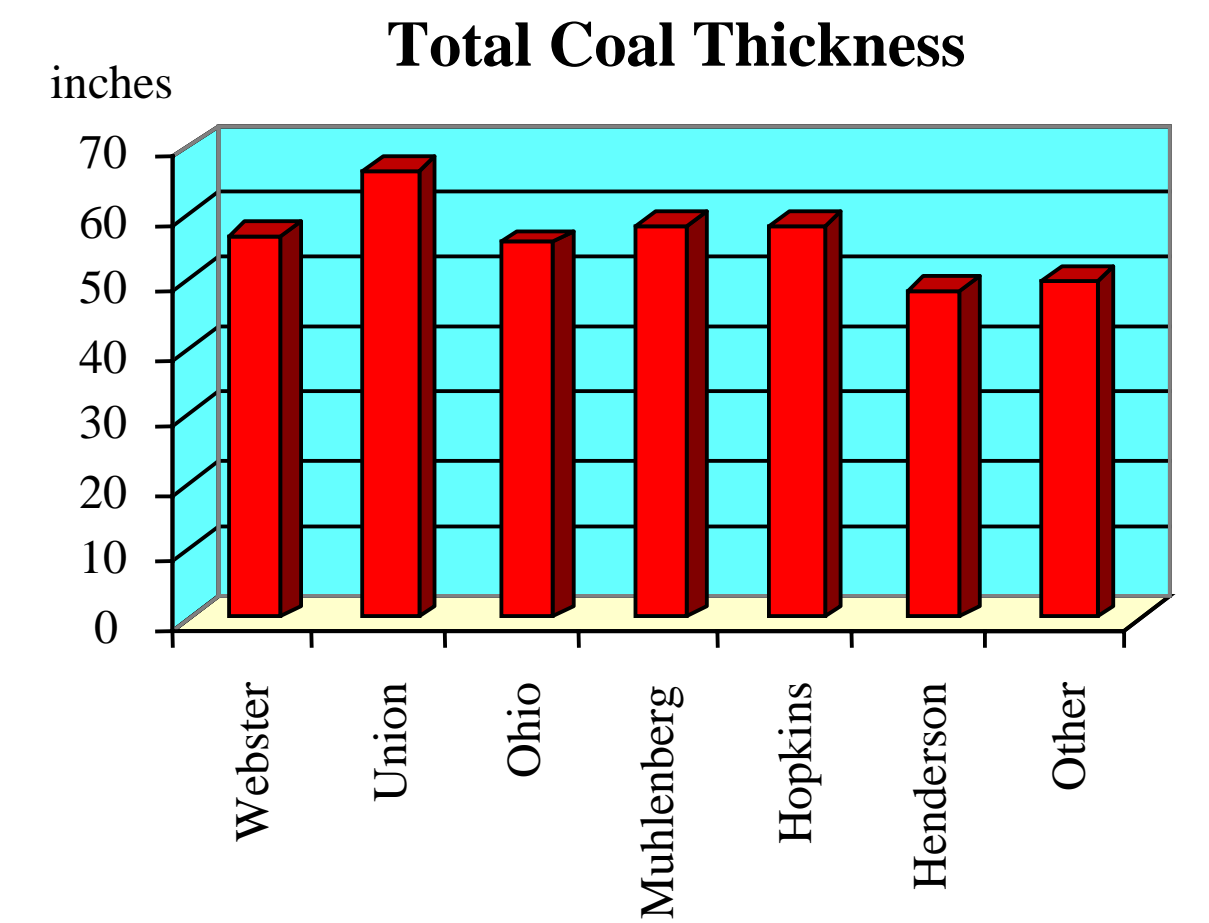
The Springfield (Western Kentucky No. 9) coal bed occurs in the Western Kentucky Coal Field and is one of the most heavily mined coals in Kentucky. The Springfield coal occurs near the middle of the Carbondale Formation, is one of the most laterally continuous coal beds in the Eastern Interior (Illinois) Basin, and has been a leading producer in Kentucky for several years. For example, in 1997 it accounted for nearly one-fourth of Kentucky's total coal production.

In western Kentucky, the Springfield is remarkably uniform, averaging 4.8 feet in thickness, 11.0 percent ash yield, 3.9 percent total sulfur, and 12,866 Btu/lb. Unfortunately, its high sulfur content has limited its use as a steam coal to electric utilities equipped with sulfur dioxide reduction technology, such as flue-gas desulfurization (often referred to as a "scrubber") or fluidized-bed combustion.

The Environmental Protection Agency is interested in the amount of mercury and chlorine in coal. Although elemental analyses are limited, KCRIS data indicate that the mercury content of the Springfield coal varies between 0.01 and 0.07 parts per million (ppm, whole coal basis). Chlorine contents vary between 100 and 1,700 ppm.

Acknowledgments
The author wishes to thank Steve Greb and Drew Andrews, who assisted in the preparation of this chart.

References Cited
Andrews, W.M., Jr., Andrews, R.E., and Hiatt, J.K., 2000, Coal resources of the Springfield coal bed in western Kentucky: Kentucky Geological Survey, series 12, Map and Chart Series 10, 1 sheet.



For information on obtaining copies of this chart and other Kentucky Geological Survey maps and publications, please call: Publication Sales (859) 257-3896
View the KGS World Wide Web site at: www.uky.edu/KGS/