Hardwood Lumber and Stumpage Prices in Two Eastern Hardwood Markets: The Real Story

Neal P. Kingsley
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Abstract

Hardwood lumber and stumpage prices appear to have risen substantially between 1964 and 1985. However, deflating these prices shows that inflation wiped out these increases for most species in two hardwood lumber markets and in a stumpage market. Only red oak, ash, and black cherry lumber prices increased faster than the rate of inflation. Yellow-poplar, basswood, hard maple, and soft maple prices actually declined in real terms.

The Authors

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Introduction

To the casual observer, hardwood lumber and stumpage prices would seem to have increased significantly during the past two decades. Market prices for hardwoods have nearly tripled between 1964 and 1985. The increases in hardwood prices were, of course, part of an overall inflationary spiral that began in the early 70's and subsided only recently.

However, hardwood prices did not increase consistently from one species to another, nor from one area to another. Because of declines in demand and changes in hardwood markets, the increases in the market price of many hardwood species failed to keep pace with the overall rate of inflation. Thus, the real or deflated prices for many species have actually dropped during the past two decades.

In this paper, we will explore the price trends—market and real—for eight important eastern hardwood species in the Appalachian and Northern hardwood lumber markets.

The Price Deflators

A period of inflation is defined as a time of generally rising prices for commodities and the factors of production (Samuelson 1964); or, stated in monetary terms, a period when the value of money is decreasing. Thus, more and more money is required to purchase the same goods. For example, in 1964, 1,000 board feet (Mbf), of #1 common 4/4 Appalachian white oak sold for $110 f.o.b. the mill. In 1985, the same lumber sold for $362 per Mbf, an increase of 229 percent. How much of this increase was due to an increase in demand or a decrease in the supply of white oak, and how much of this apparent change was due to the decrease in the value of money?

To answer these questions economists use a price index. A price index compares the current price of a good or service with its price in a predetermined base year. The base year 1967 is used commonly. Using a price index, we can deflate current reported prices in various years to comparable 1967 prices. Various price indices are suited to measuring various segments of the economy. The most familiar is the Consumer Price Index or CPI. This measures the price of a hypothetical aggregation of typical consumer goods and services at any given time relative to the price of the same goods and services at a particular point in time. Thus, according to the CPI, $319 was needed in 1985 to purchase the same goods that $100 purchased in 1967. Or, 31.9 cents in 1985 has the same purchasing power as $1.00 in 1967.

Hardwood lumber has no utility in and of itself until it is used to produce a final product—a chair, a pallet, or part of a home. Hence, it is termed a producer good as opposed to a consumer good. By using a Producer Price Index or PPI, we can get a more accurate measure of the relative price of hardwood because it does not include the costs of consumer goods and services. The most commonly used PPI is the "Producer Price Index of All Commodities," formerly called the "Wholesale Price Index." This index includes nearly 3,400 commodities selected to represent the movement of prices of all commodities produced in the manufacturing, agriculture, forestry, fishing, mining, gas and electricity, and public utilities sectors of the economy.

Producer Price Indices also can be developed for various commodities or stages of production. The appropriate index for our purposes is the "Hardwood Lumber Producer Price Index" or PPI-Hardwood. By using this index, we can look at the relative prices in transactions involving only the production of hardwood lumber.

All three price indices, CPI, PPI, and PPI-Hardwood, are shown in Figure 1. Of the three, PPI-Hardwood shows the greatest change from quarter to quarter because it is restricted to a single commodity—hardwood lumber. The curve is not smoothed out by off-setting changes in prices of different commodities. For this reason, PPI-Hardwood most accurately reflects the relative prices of hardwood lumber. Because the PPI-Hardwood applies to the general price level of all hardwood lumber produced in the Nation, we can expect some variation from one region to another, from one species to another, and from one lumber grade to another.

Hardwood Lumber Price Trends

By applying the Hardwood Lumber Producer Price Index to hardwood lumber prices, we can convert current prices to their relative 1967 price. These prices relative to 1967 are called "real" prices. The current prices used in this paper are those reported in "The Hardwood Market Report" for two hardwood lumber market areas: the Appalachian market centered in Johnson City, Tennessee, and the Northern market centered in Wausau, Wisconsin.[1] Prices reported are average market prices for carload quantities f.o.b. the mill.

Our discussion is limited to eight major eastern hardwood species: black cherry, basswood, ash, red oak, white oak, soft maple, hard maple, and yellow-poplar. Black cherry, white oak, and yellow-poplar are not traded in sufficient quantities in the Northern market to provide reliable price quotations. Thus, regional price comparisons are not possible for these species. The remaining five species are traded in both markets. Graphs of the current and real lumber and stumpage prices of these eight species are in the Appendix.

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[1] Hardwood Market Report, P.O. Box 40042, 1418 Madison Ave., Memphis, TN 38174-0042.

CONSUMER PRICE INDEX
(1967 = 100)

HARDWOOD PRICE INDEX
(1967 = 100)

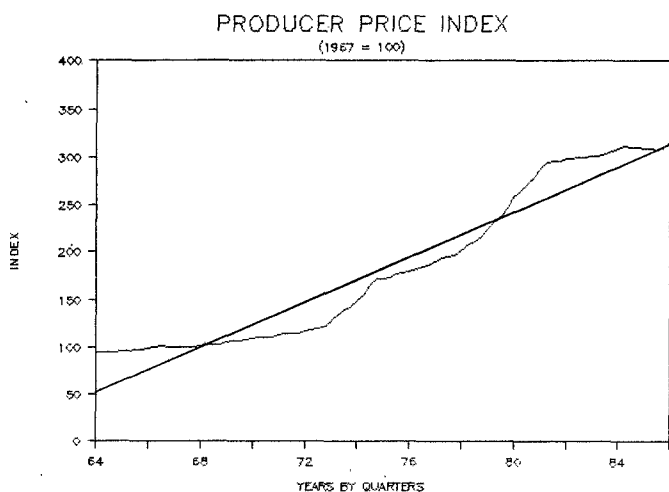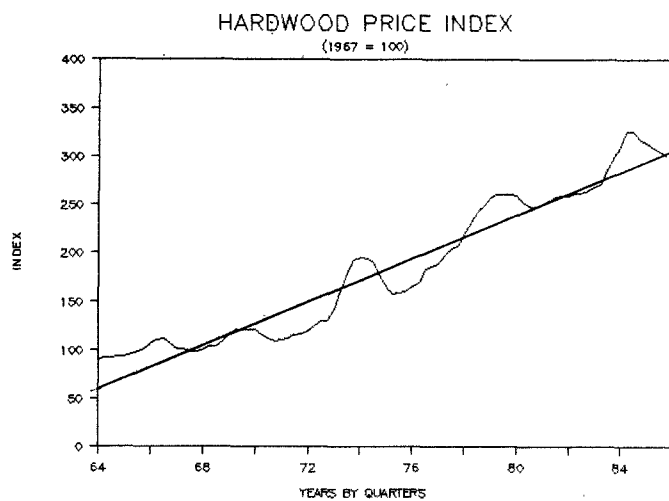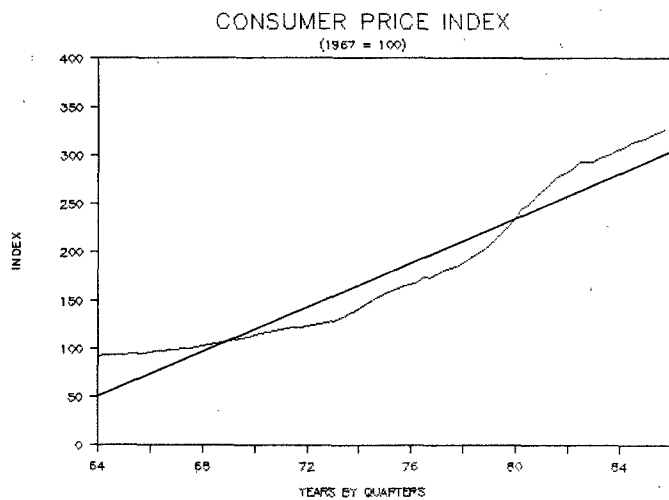## PRODUCER PRICE INDEX
(1967 = 100)

Figure 1.—Three price indices—1967 = 100—1964–1985.

Table 1 shows the real and current prices of No. 1 common lumber at the opening and closing of the 21-year period. The table shows that the real price of No. 1 common white oak lumber was less than 1 percent below what it was in 1964—in other words, it remained essentially unchanged. Real prices of many of the above species failed to keep pace with inflation. Some, in fact, fared quite poorly. Soft maple in the Northern market closed the 21-year period with a real price drop of 48 percent. Only three species were able to stay ahead of inflation. These were red oak in both markets, and ash and black cherry in the Appalachian market.

Lumber prices generally followed economy-wide price trends during the period. From 1964 through 1973, inflation averaged 4.4 percent per year. During this period, current lumber prices remained steady or rose modestly. For the period 1973 to 1980 the rate of inflation averaged about 9.4 percent and current lumber prices rose sharply. Lumber prices became erratic during this period as producers struggled to cover skyrocketing production costs and con- sumers resisted sharp price increases. Some species successfully resisted sharp increases in current price. This is more clearly evident for those species with a normally low demand, such as yellow-poplar and the maples. These are the "losers" and "big losers" in Table 1. By 1980, inflation had peaked at 14 percent and it seems that every species resisted the tendency to increase in price. Inflation began to moderate in 1981 and 1982. Generally, the higher valued species continued to increase in current price while the lower valued species tended to stay on or near the same plateau. By 1983, inflation had subsided to about 2 percent, and current prices of many species began to show signs of declining. Although it may be too early to tell, this may indicate a return to moderation in current price trends in the hardwood lumber industry.

Factors That Influence Hardwood Price Trends

The price of any commodity is ultimately a function of supply and demand. For lumber, price is determined by the supply of lumber made available by sawmills, called mill- stocks, and the demand of hardwood lumber consumers for these millstocks. The overall demand for hardwood lumber, as measured by production, has been declining in recent years. Hardwood lumber production in the United States declined from 7.2 billion board feet in 1952 to 6.7 billion in 1977 (USDA Forest Service 1982). The significance of this decline is amplified by the fact that the population in the United States rose from 157.6 million in 1952 to 216.9 million in 1977 (USDA Forest Service 1982). Thus, on a per-capita basis domestic hardwood lumber production fell from 45.7 to 30.9 board feet. Most of this decline has been brought on by favorably priced substitutes for hardwoods in many products, primarily steel and plastics. Because the demand for hardwood lumber has not grown, the real price of hardwood lumber generally cannot grow.

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Table 1.—Real and nominal prices of No. 1 Common 4/4 lumber per thousand board feet, f.o.b. the mill, for select species by price trend[a] in two regional markets, 1st quarter 1964 and 4th quarter 1985

Species	Market[b]	Real price (1967 dollars)				Current price (Current dollars)			
		1964	1985	Price change	Price change	1964	1985	Price change	Price change
				Dollars	*Percent*			*Dollars*	*Percent*
WINNERS									
Red Oak	AH	125	146	21	17	115	450	335	291
Ash	AH	134	147	13	10	124	452	328	264
Red oak	NH	146	152	6	4	135	467	332	246
Black Cherry	AH	195	198	3	1	180	608	428	238
MODERATE LOSERS									
White Oak	AH	119	118	−1	−1	110	362	252	229
Ash	NH	163	153	−10	−6	150	470	320	213
LOSERS									
Basswood	AH	148	101	−47	−32	137	310	173	126
Hard Maple	AH	168	108	−60	−36	155	332	177	114
Soft Maple	AH	173	109	−64	−37	160	335	175	109
BIG LOSERS									
Yellow-poplar	AH	147	88	−59	−40	136	270	134	98
Basswood	NH	146	88	−58	−40	135	270	135	100
Hard Maple	NH	163	91	−72	−44	150	280	130	87
Soft Maple	NH	168	87	−81	−48	155	267	112	72

[a]Winners—Real price remained the same or increased.
Moderate Losers—Real prices declined less than 10 percent.
Losers—Real prices declined 10 to 39 percent.
Big Losers—Real prices declined 40 percent or more.
[b]AH—Appalachian hardwood market, Johnson City, TN, and vicinity.
NH—Northern hardwood market, Wausau, WI, and vicinity.

This explains the overall trend in hardwood lumber, but what about the short-run ups and downs? Again the answer is supply and demand, but, in this case, short- run supply and demand. The hardwood lumber market is cyclical. This cycle depends both on the normal business cycle and on seasonal variation in production. Over 50 percent of all hardwood lumber goes into industrial uses.[2] Therefore, hardwood lumber demand is strongly influenced by general industrial activity. As industrial activity improves, inventories at sawmills, called millstocks, are drawn down. As millstocks decrease, lumber price increases. This price increase stimulates production which builds millstocks until supply again exceeds demand and price beings to decline (Luppold 1986). This inherent cyclical tendency is accelerated by the large number of very small, part-time mills in the industry. As prices increase, these mills go into production to replenish millstocks rapidly. As prices drop, these mills go out of production. This tends to make the distance between peaks and valleys in production much steeper. Hardwood lumber prices are influenced by the business cycle. This is shown by comparing the short-run movement of prices with the overall economy. It is more evident when looking at real price changes than when looking at the movement of current prices. Inflation has the effect of masking the true movement of prices.

Hardwood lumber prices are also influenced by seasonal production cycles. In many regions, winter weather forces a slowdown in logging activity. Also, many areas limit gross vehicle weight on secondary roads in the spring to reduce road damage. This means that logs cannot be hauled to the mill during these times. If millstocks are low going into these periods, prices can be expected to continue to rise because millstocks cannot be easily replenished. Conversely, during periods of good weather millstocks may increase in anticipation of poor weather to the point that prices may become depressed.

We have discussed the reasons for long- and short-run price movements, but why did some species and grades do better than others during the past two decades? Hardwood lumber is used in a vast array of products from fine furniture to shipping pallets. Demand for quality uses such as furniture depends greatly on consumer preference. Over the past two decades, oak furniture has been preferred. Maple furniture, on the other hand has lost favor with consumers. Black cherry has maintained favor, and, since supplies of furniture grade cherry are limited, prices have increased. In addition to being a preferred species for furniture in the U.S. market, exports of oak have increased significantly since 1972 (Luppold and Jacobsen 1985).

Export demand for oak primarily effects the best grades called Firsts and Seconds (FAS). However, domestic demanders of FAS, to some degree, can shift demand to the next lower grade, No. 1 Common (1C) (Luppold and Jacobsen 1985). This has tended to increase the price of 1C oak lumber.

Other species have few outlets to speak of relative to their abundant supply. Consumption of soft maple and yellow-poplar lumber has declined while timber inventories of these species have increased.

Lumber Prices and Stumpage Prices

The stumpage prices quoted here are from "Ohio Timber Prices" published semiannually by the Ohio Crop Reporting Service of the USDA Statistical Reporting Service. Five other states in the northeast—Maine, Massachusetts, New York, Pennsylvania, and West Virginia—publish stumpage prices either semiannually or bimonthly. Two others, Kentucky and New Hampshire, publish annual price reports (Rosen 1984). Ohio prices were used here because they are believed to be generally representative of prices in the hardwood region and because they provide comparable information for the period 1964 through 1985.

As a general rule, real stumpage prices in Ohio have followed the same trends as real lumber prices in the Appalachian market area. Two exceptions are black cherry and soft maple. Despite the fact that real prices of black cherry lumber have increased in the Appalachian market, black cherry stumpage prices have declined in Ohio. The reason for this is that black cherry is not a commercially important species in Ohio (Dennis and Birch 1981). The black cherry sawtimber in Ohio is of too poor quality for furniture stock—76 percent is in Grade 3 or poorer sawlogs. Soft maple stumpage prices, while declining, have not declined as rapidly in Ohio as have soft maple lumber prices in the two market areas. An explanation for this may be Ohio's relatively large pallet industry, which can utilize soft maple along with many other species. Thus, a stronger demand for soft maple seems to exist in Ohio than in other states in the region.

Stumpage prices are residual prices. They represent the difference between the selling price of lumber and the total operating costs and profits incurred in removing the timber and converting it into lumber (Zaremba 1963). The actual cost of growing the timber is, therefore, not reflected in the stumpage price. The would-be timber seller, of course, must be aware of what it costs to grow timber. For only by knowing these costs can the seller know what price will recover the cost of growing timber.

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[2] Personal communication with W. G. Luppold, Northeastern Forest Experiment Station, Princeton, WV.

Because stumpage prices are derived from lumber prices, lumber prices exert a push-pull effect on stumpage prices. Rising lumber prices tend to pull stumpage prices up and, conversely, falling lumber prices tend to depress stumpage prices (Zaremba 1963). However, lumber and stumpage do not move together. Since lumber prices must increase in order for stumpage prices to increase, there is a lag in the increase in stumpage prices.

The short-run trends of real stumpage prices clearly show the effect of the oil crises of 1973 and the mid to late 1970's. This reflects the fact that motor fuel is a significant cost item in modern logging. In order to cover this increased cost, loggers were forced to bid lower for stumpage. This situation did not correct itself until inflation began to moderate about 1980.

The Potential Timber Seller and the Timber Market

The owner of nonindustrial private forest land who is contemplating the sale of timber needs to understand both the hardwood lumber and stumpage markets in the selling area. Most particularly, one needs to be aware of how inflation can mask the real changes in lumber and stumpage prices. As we have seen, substantial increases in price can be more than cancelled out by inflation. By observing the actions of the lumber market, the seller can anticipate increasing or decreasing stumpage prices. By keeping an eye on the general business cycle, the potential timber seller can get a feel for trends in hardwood lumber and stumpage prices. Millstocks and weather patterns are also important barometers of short-run price trends. It is important for potential sellers to remember that increases in lumber prices often foretell a rise in stumpage prices. Keeping an eye on trends in the lumber or stumpage markets is easier said than done. Public reporting of lumber or stumpage prices on a regular basis is not available in most areas. For this reason it is in an owner's best interest to obtain the services of a forester to handle the timber sale. Most foresters are familiar with the timber market in their area and are in a position to predict upswings and thus recommend the best time for an owner to offer timber.

As we have seen, the real lumber prices of most hardwood species have declined in the Appalachian and Northern market areas since 1964. So have real stumpage prices for most of these species in Ohio. We have also noted that stumpage prices do not reflect the actual costs of growing timber. In the face of long term declining real stumpage prices, it will often be difficult for the timber grower to justify expenses incurred in cultural treatments solely on the basis of future stumpage values. When considering treatments, the owner, therefore, should favor thinnings and other treatments that can pay for themselves in terms of saleable products or those treatments that improve the non-commodity values of his woodland.

The potential timber seller should also keep in mind that large, top-quality logs will bring a substantially better price than smaller logs of lower quality. Figure 2 illustrates this fact. Notice that delivered prices of Grade 1 sawlogs over 16 inches diameter at the small end, inside bark averaged 28 to 65 percent above the average price of all logs delivered to Ohio mills in the September through November 1985 reporting period. Conversely, prices of Grade 2 and 3 logs ran as much as 60 percent below the average. Thus, the timber grower would do well to identify those potentially large high-value trees early and to favor their growth and development into money-making trees. Past performance indicates that black cherry, red oak, ash, and white oak would be the species to favor (Table 1). On the other hand, the maples and yellow-poplar should generally be discouraged.

This study is based on past market performance of selected hardwood species in two lumber markets in the Eastern region of the United States. The reader should keep in mind that the situation may be significantly different in other regions and for other species. In addition, unforeseen developments, such as changing consumer preferences or improved utilization may significantly improve the marketability of presently low-value species. Thus, however unlikely it may seem at this point in time, it may not be safe to assume that "the past is prologue."

Also this analysis covers a broad region and local situations may vary significantly from the broader regional picture. For this reason, potential timber sellers need to be aware of the local market situation as well as the larger regional picture. For instance, a strong market for yellow-poplar or other generally lower value species may exist locally while the market for ash is very poor.
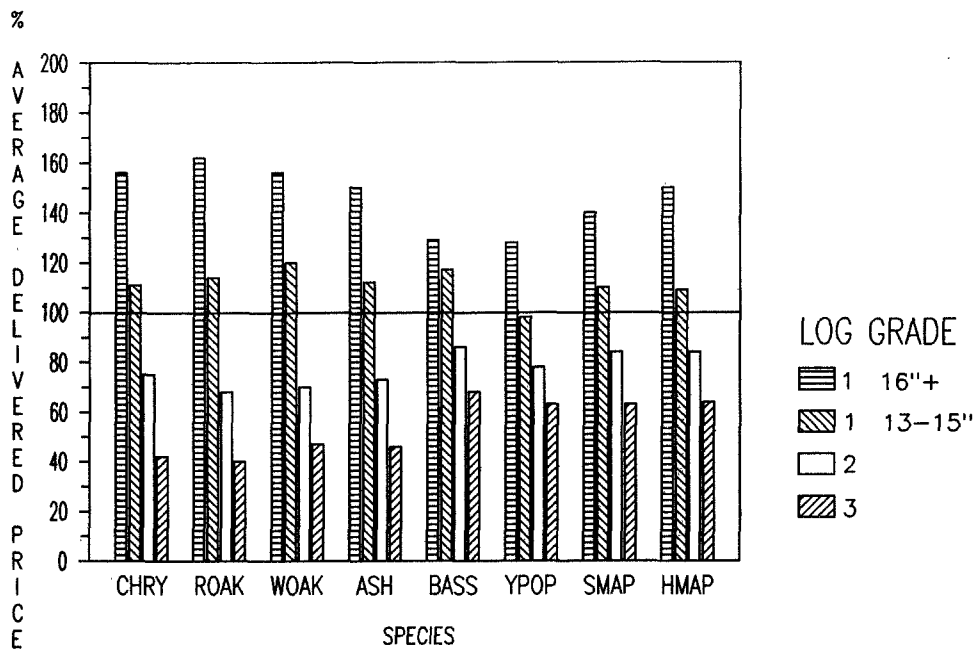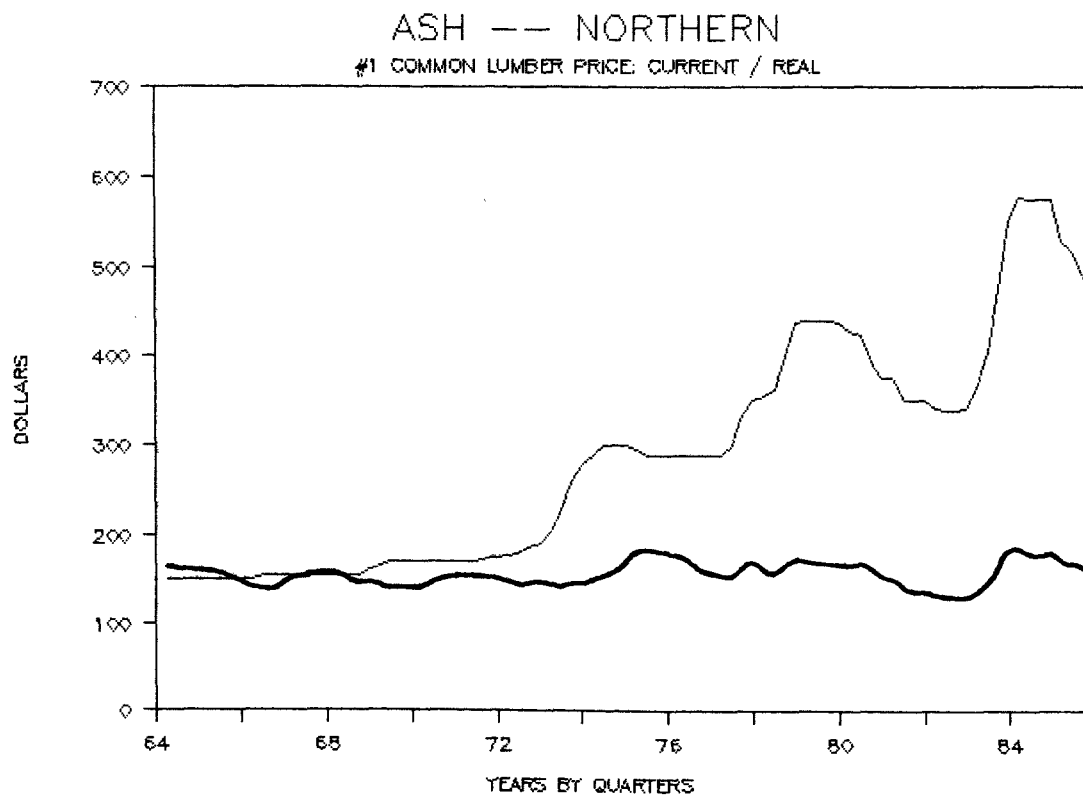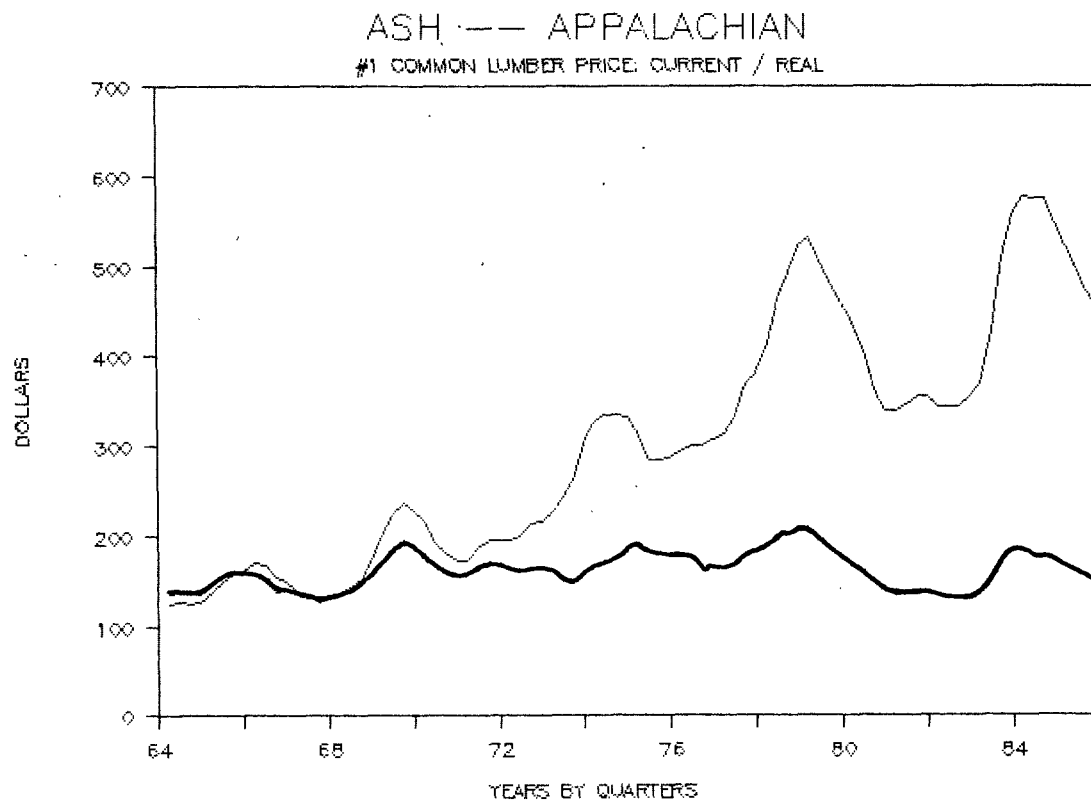
Figure 2.—Delivered log prices by species and log grade compared to average prices of all delivered logs by species, Ohio, September-November 1985.
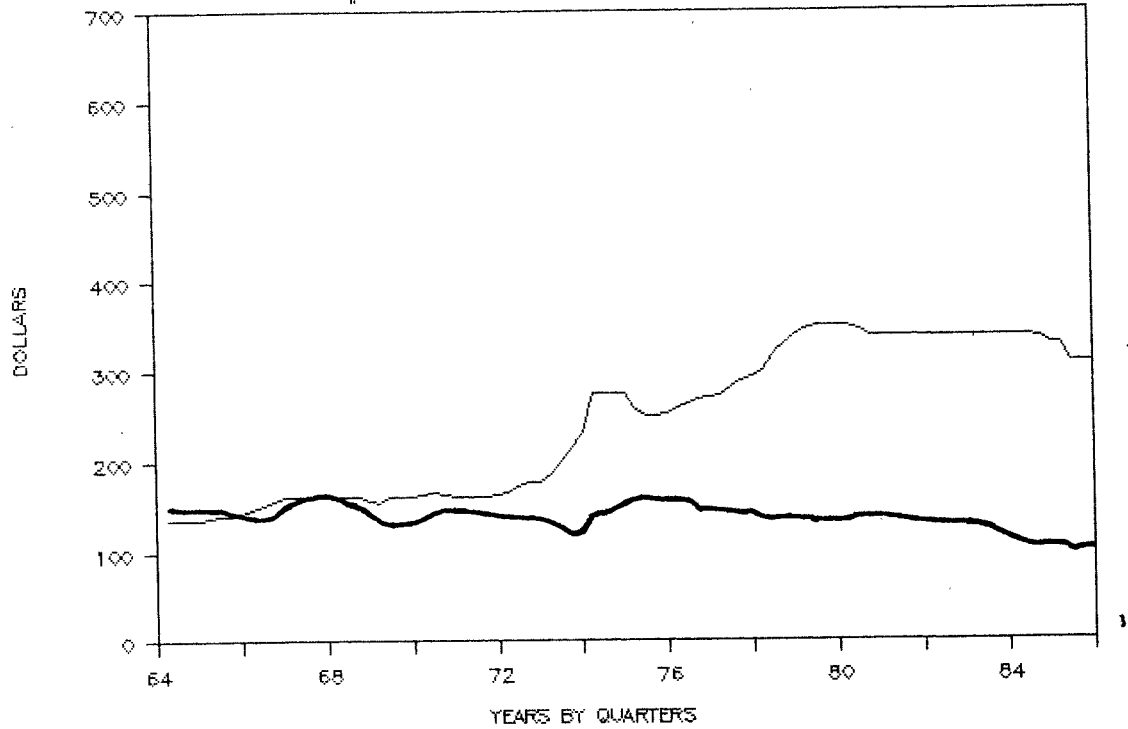
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Appendix

ASH —— APPALACHIAN
#1 COMMON LUMBER PRICE: CURRENT / REAL

YEARS BY QUARTERS

ASH —— NORTHERN
#1 COMMON LUMBER PRICE: CURRENT / REAL

YEARS BY QUARTERS

7

BASSWOOD — APPALACHIAN
#1 COMMON LUMBER PRICE: CURRENT / REAL

DOLLARS

YEARS BY QUARTERS

BASSWOOD — NORTHERN
#1 COMMON LUMBER PRICE: CURRENT / REAL

DOLLARS

YEARS BY QUARTERS

8
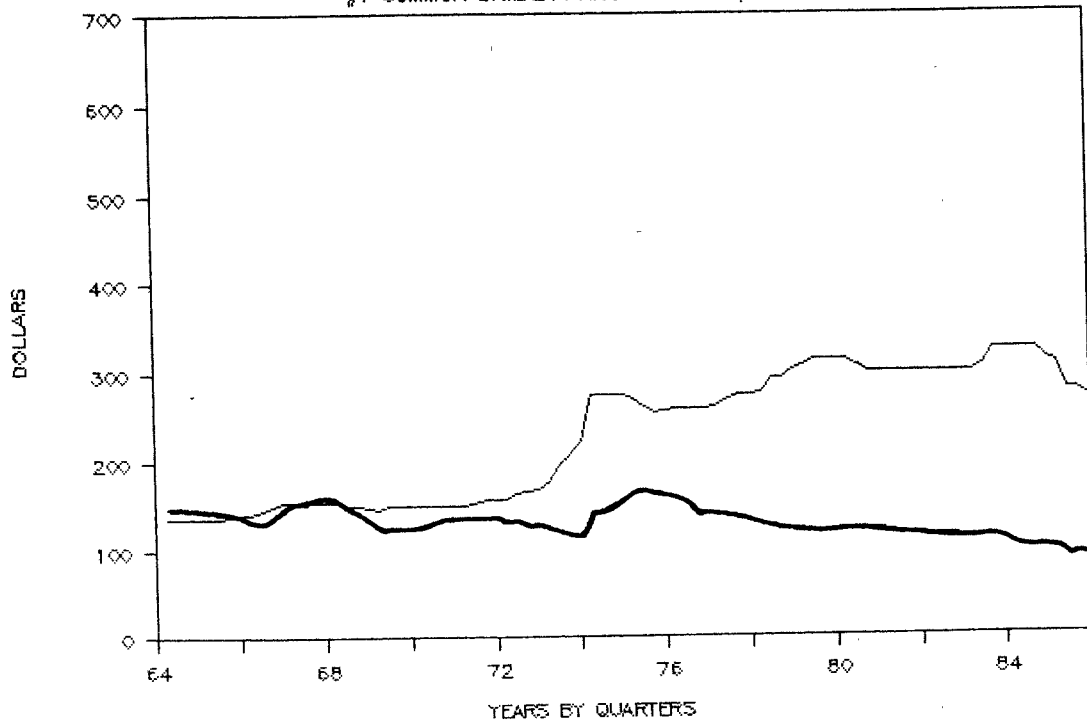
BLACK CHERRY —— APPALACHIAN
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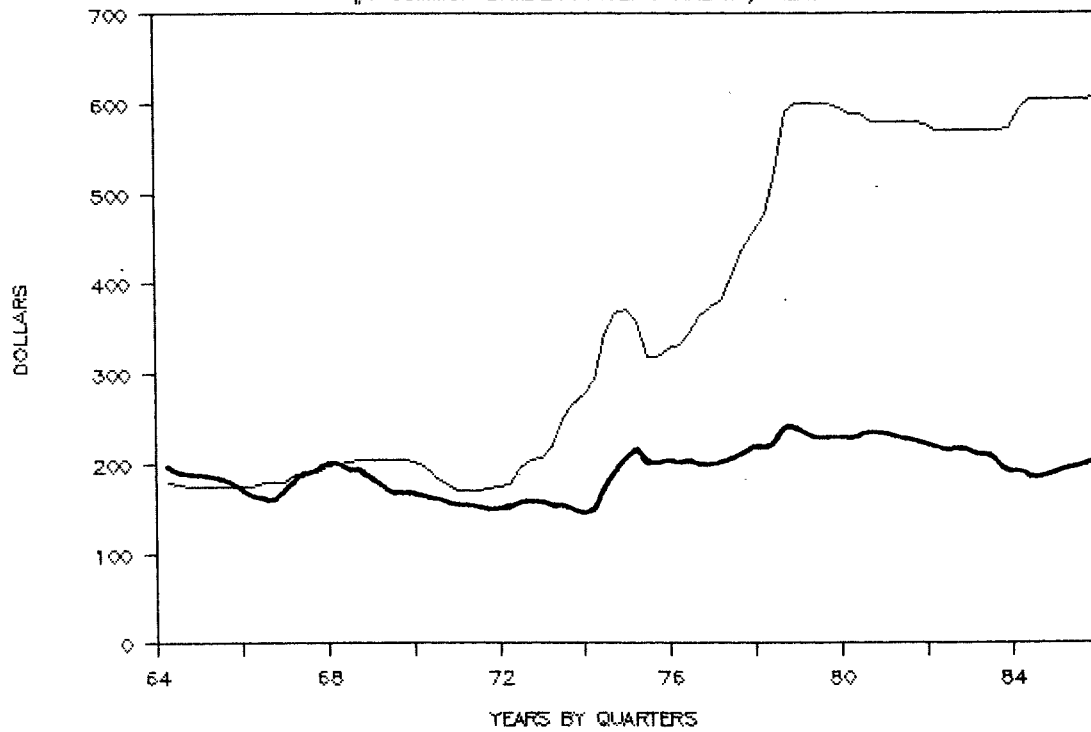
DOLLARS

YEARS BY QUARTERS

HARD MAPLE —— APPALACHIAN
#1 COMMON LUMBER PRICE: CURRENT / REAL

DOLLARS

YEARS BY QUARTERS

HARD MAPLE —— NORTHERN

#1 COMMON LUMBER PRICE: CURRENT / REAL

DOLLARS

YEARS BY QUARTERS

RED OAK —— APPALACHIAN

#1 COMMON LUMBER PRICE: CURRENT / REAL

DOLLARS

YEARS BY QUARTERS

10
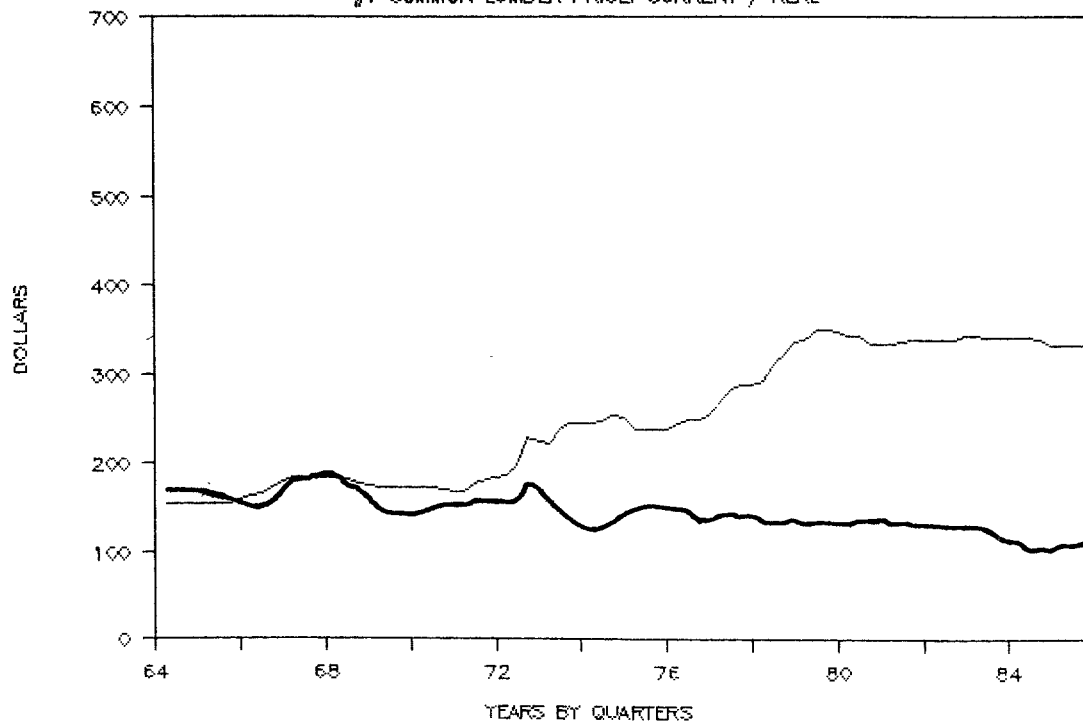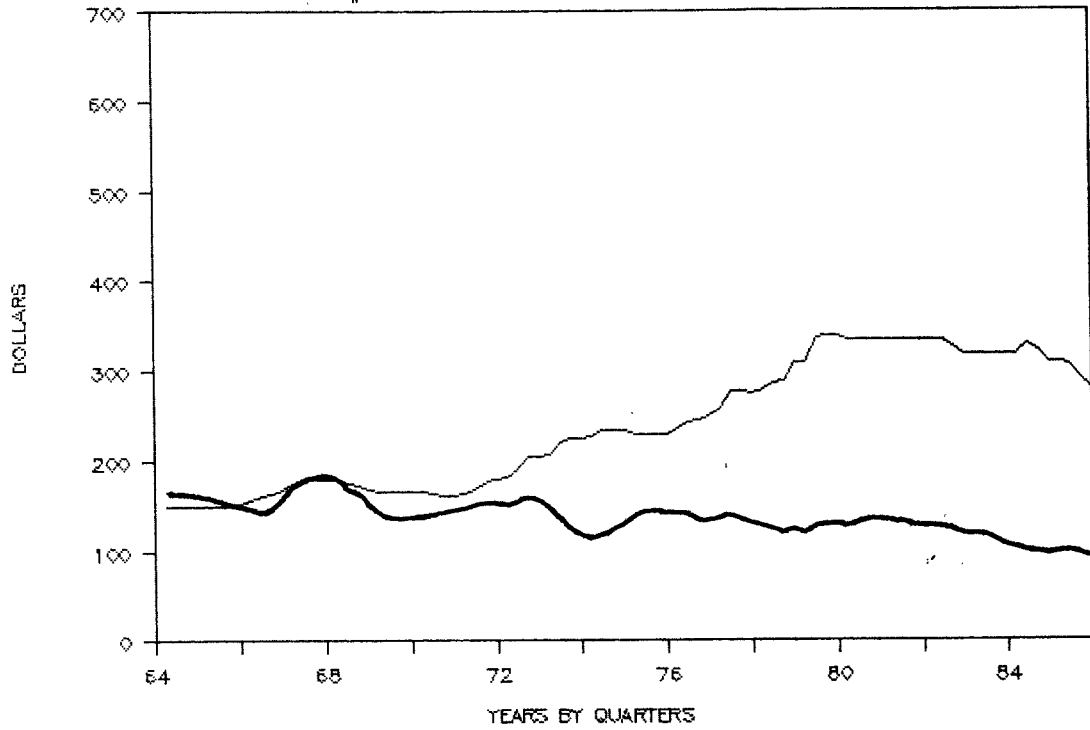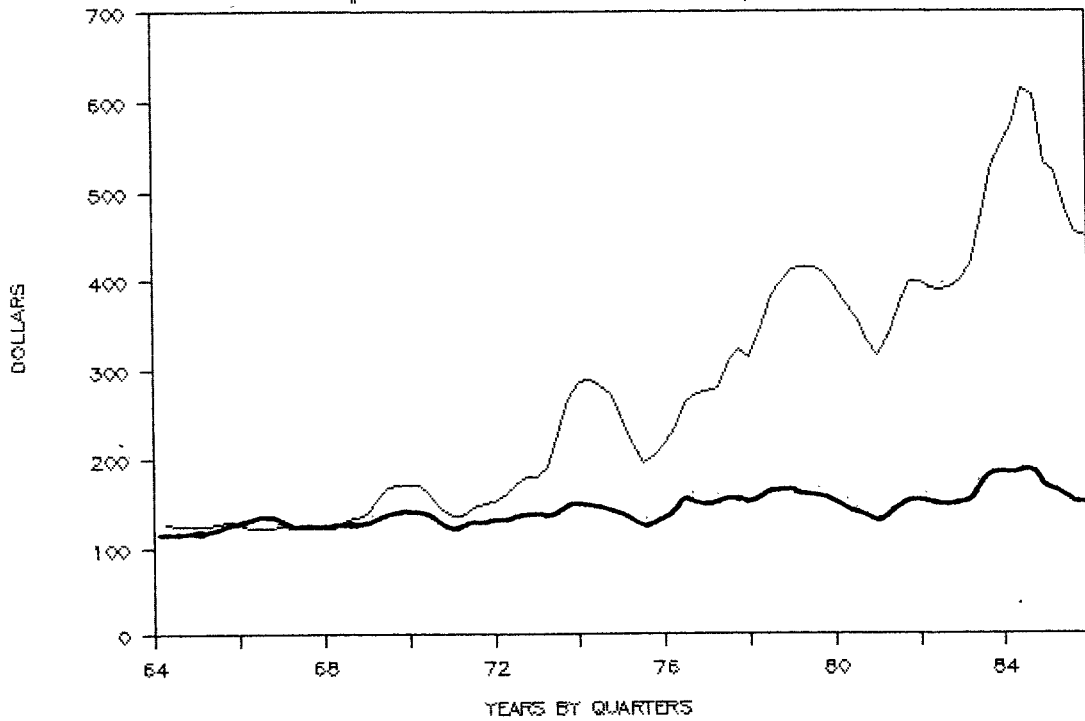
RED OAK —— NORTHERN
#1 COMMON LUMBER PRICE: CURRENT / REAL

DOLLARS

YEARS BY QUARTERS

WHITE OAK —— APPALACHIAN
#1 COMMON LUMBER PRICE: CURRENT / REAL

DOLLARS

YEARS BY QUARTERS

11
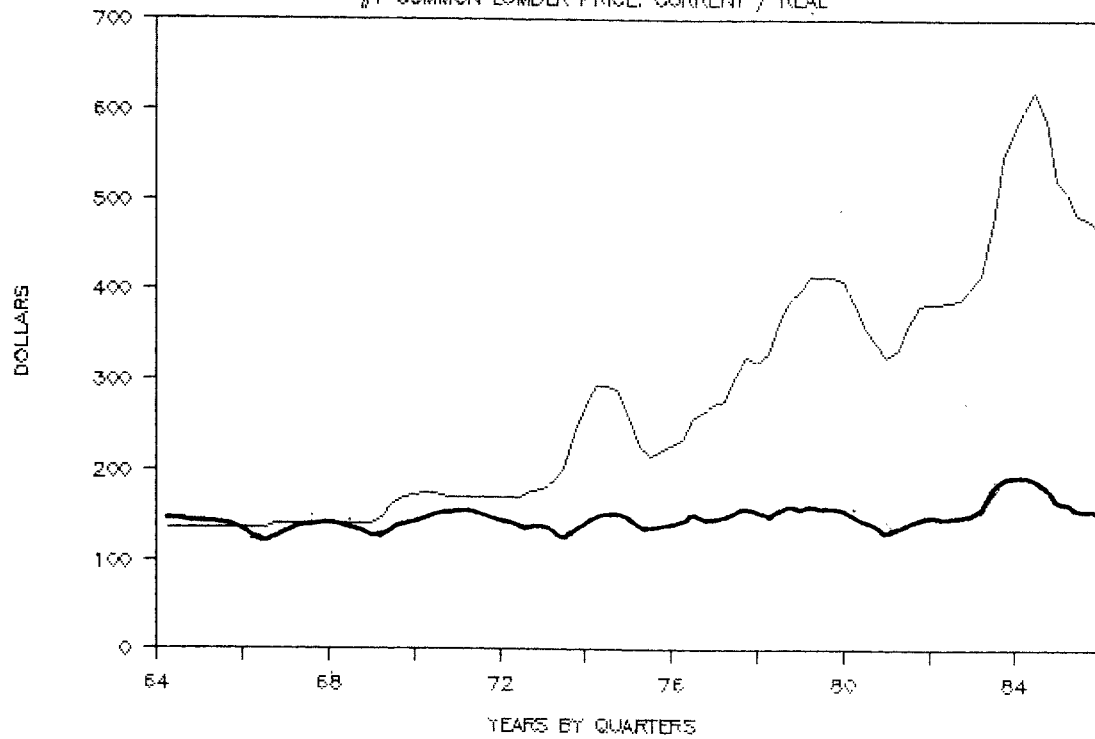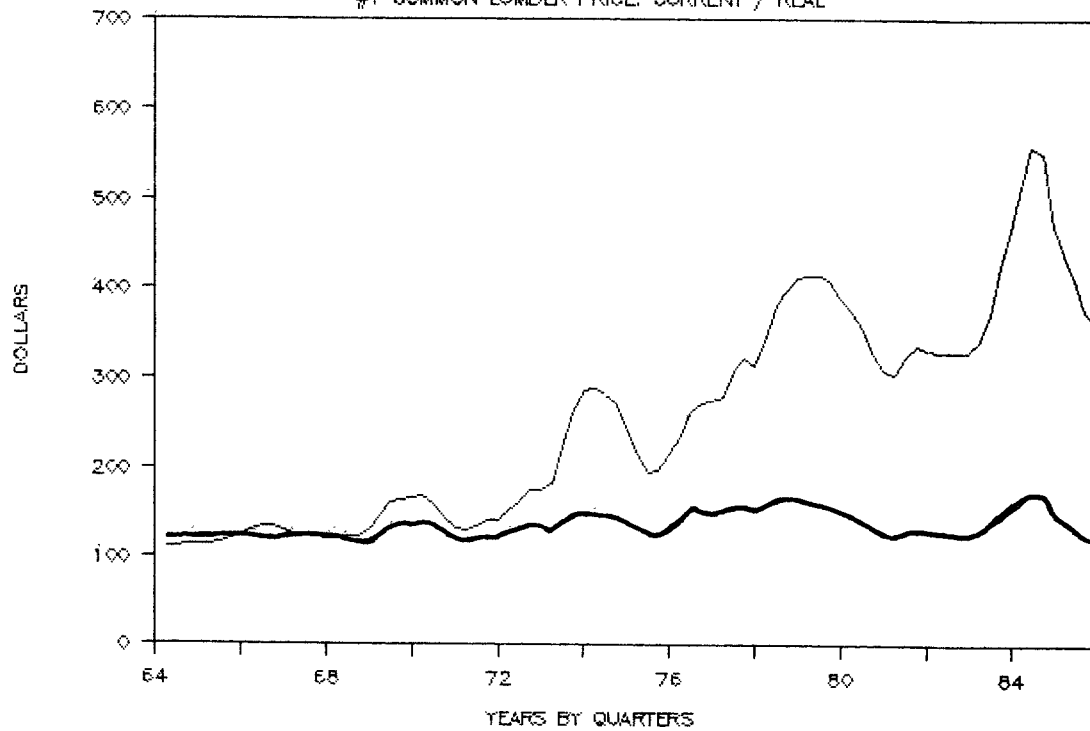
SOFT MAPLE —— APPALACHIAN
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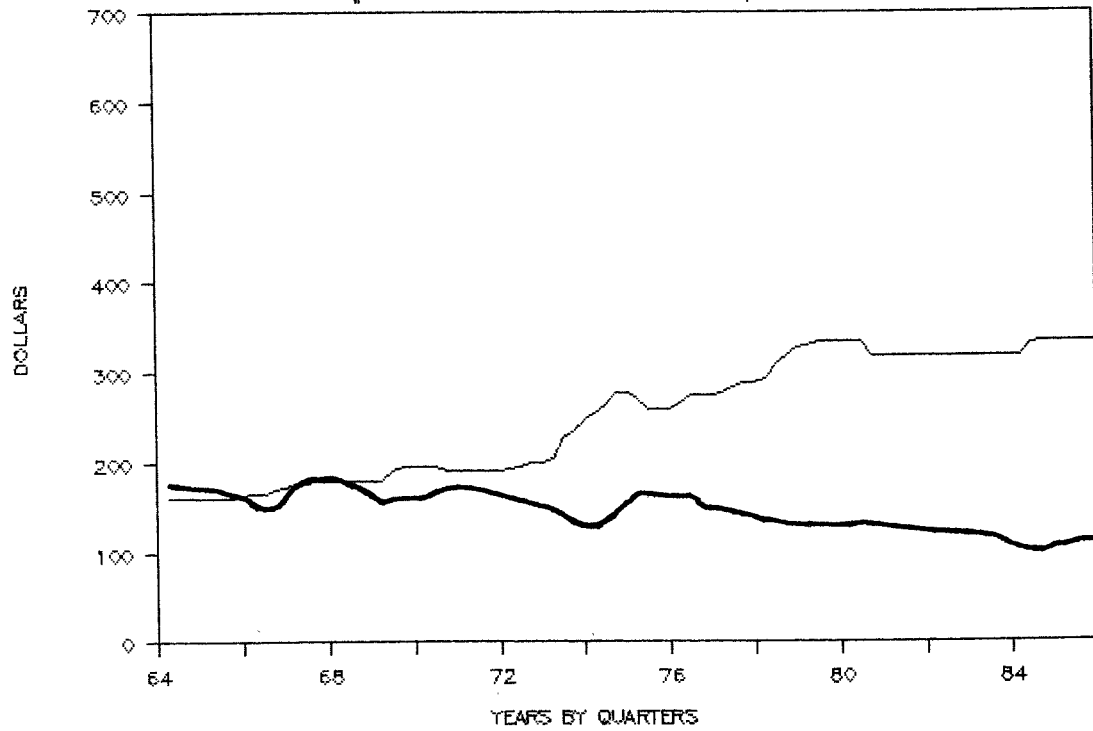
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#1 COMMON LUMBER PRICE: CURRENT / REAL

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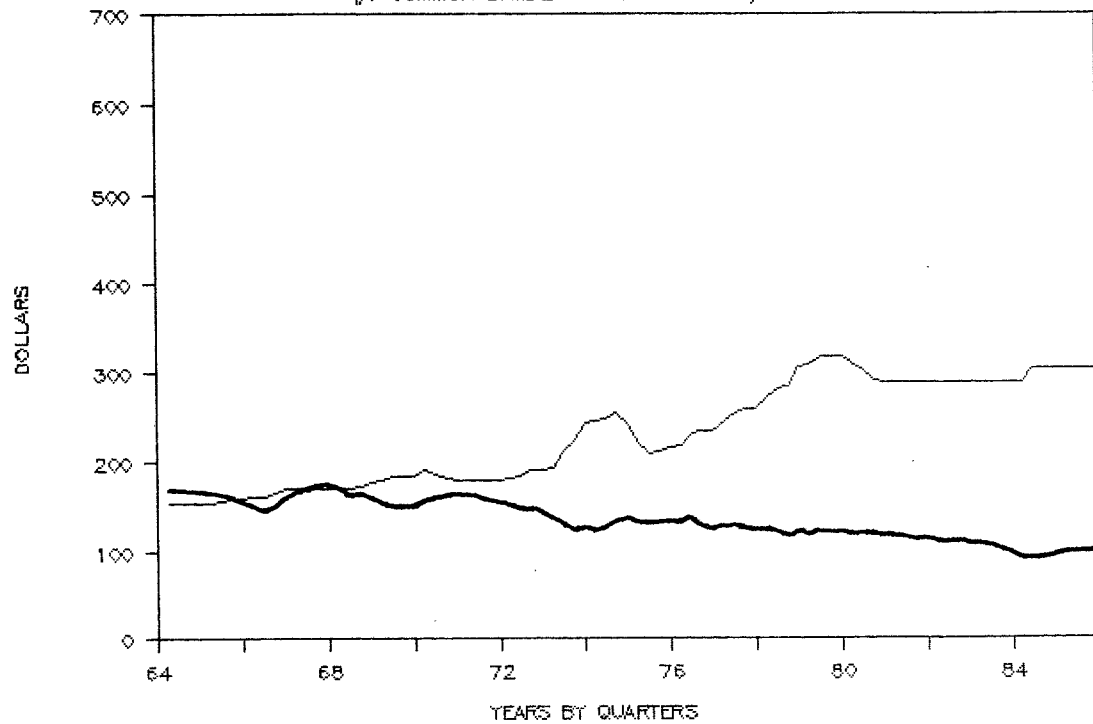
YELLOW—POPLAR —— APPALACHIAN
#1 COMMON LUMBER PRICE: CURRENT / REAL

YEARS BY QUARTERS
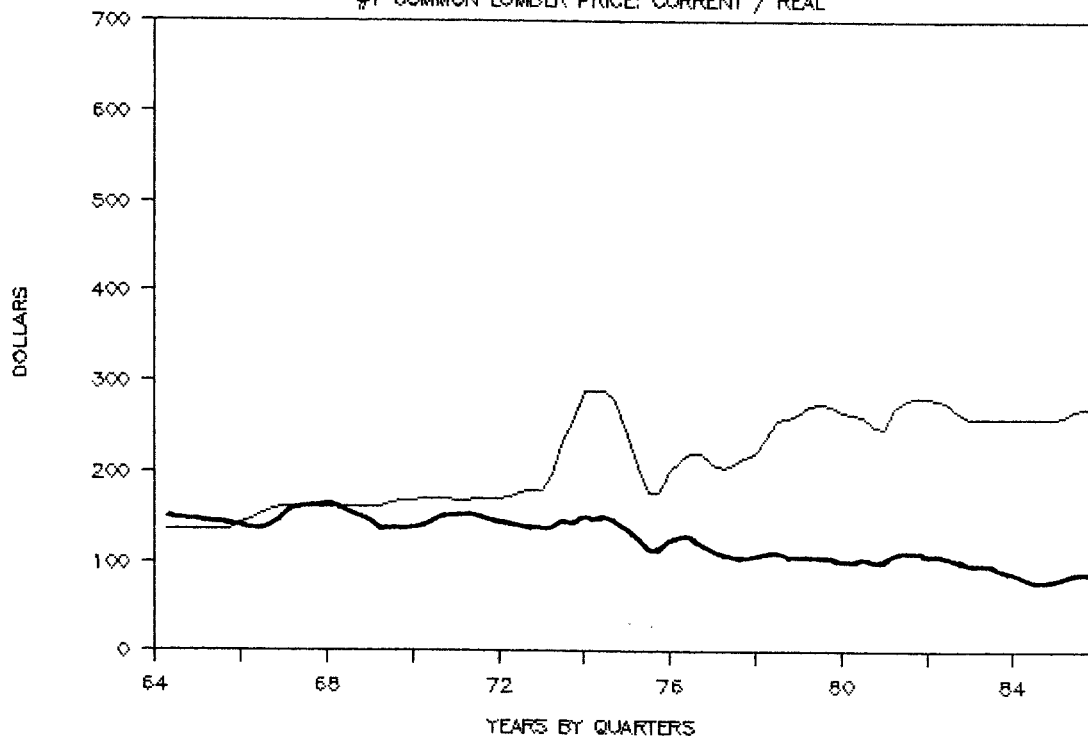
ASH STUMPAGE PRICES: OHIO
ACTUAL / REAL (1967 = 100)

YEARS

13
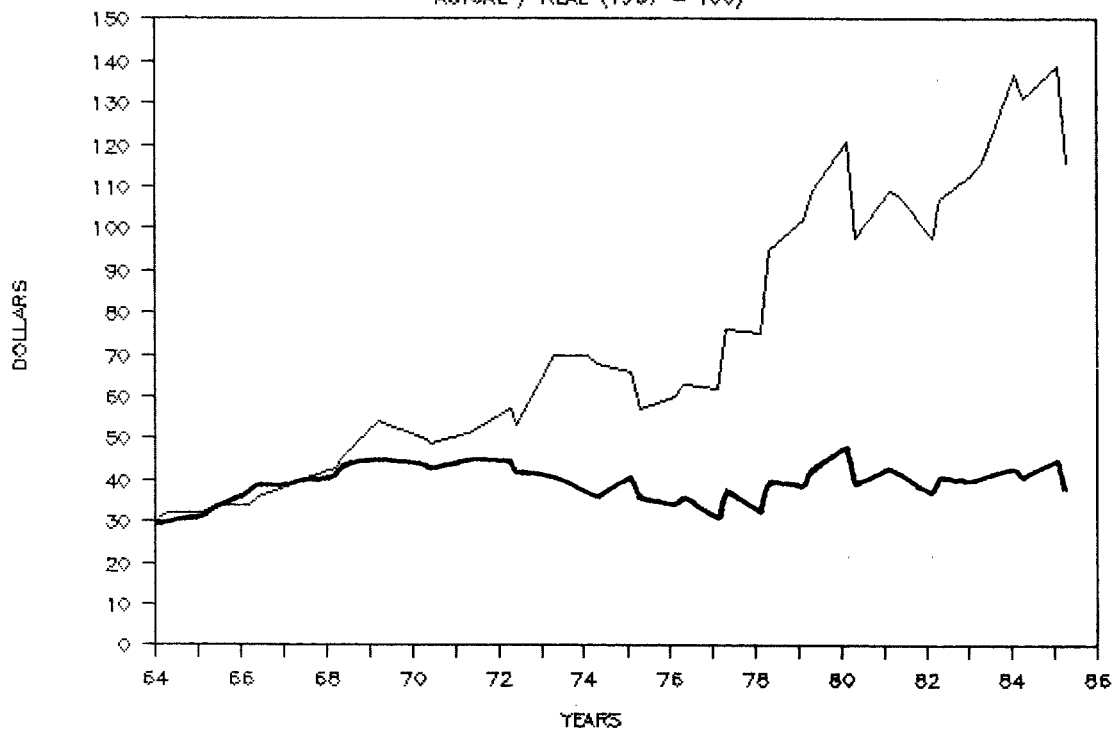
BASSWOOD STUMPAGE PRICES: OHIO
ACTUAL / REAL (1967 = 100)
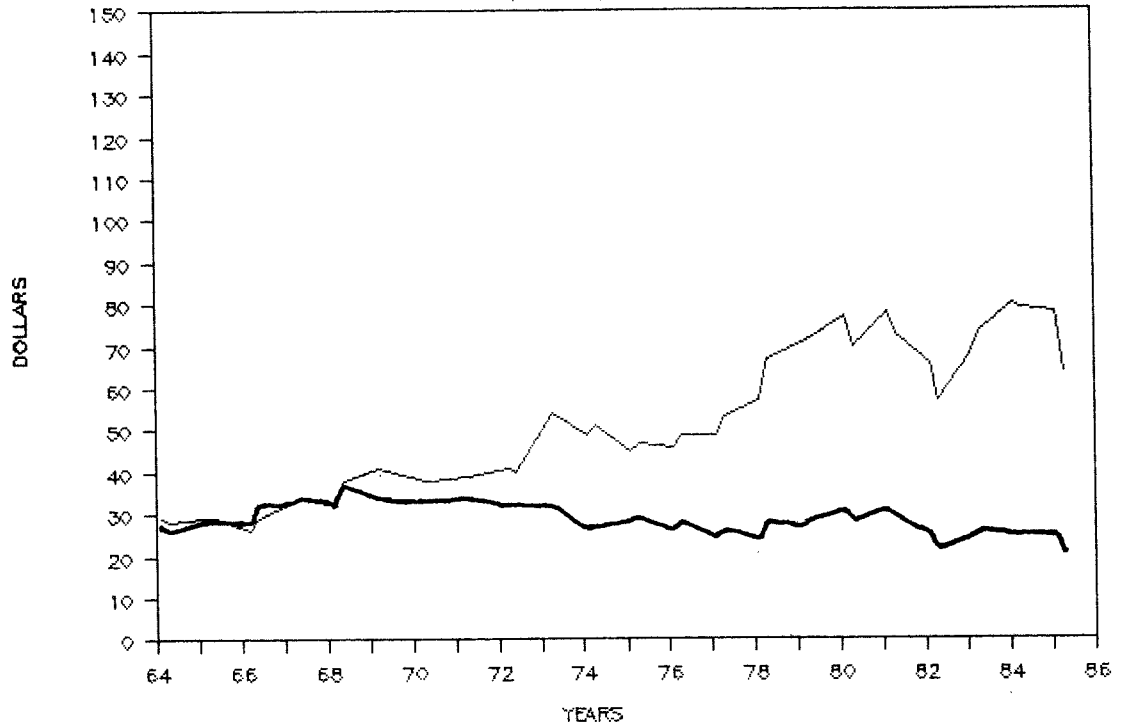
BLACK CHERRY STUMPAGE PRICES: OHIO
ACTUAL / REAL (1967 = 100)

14
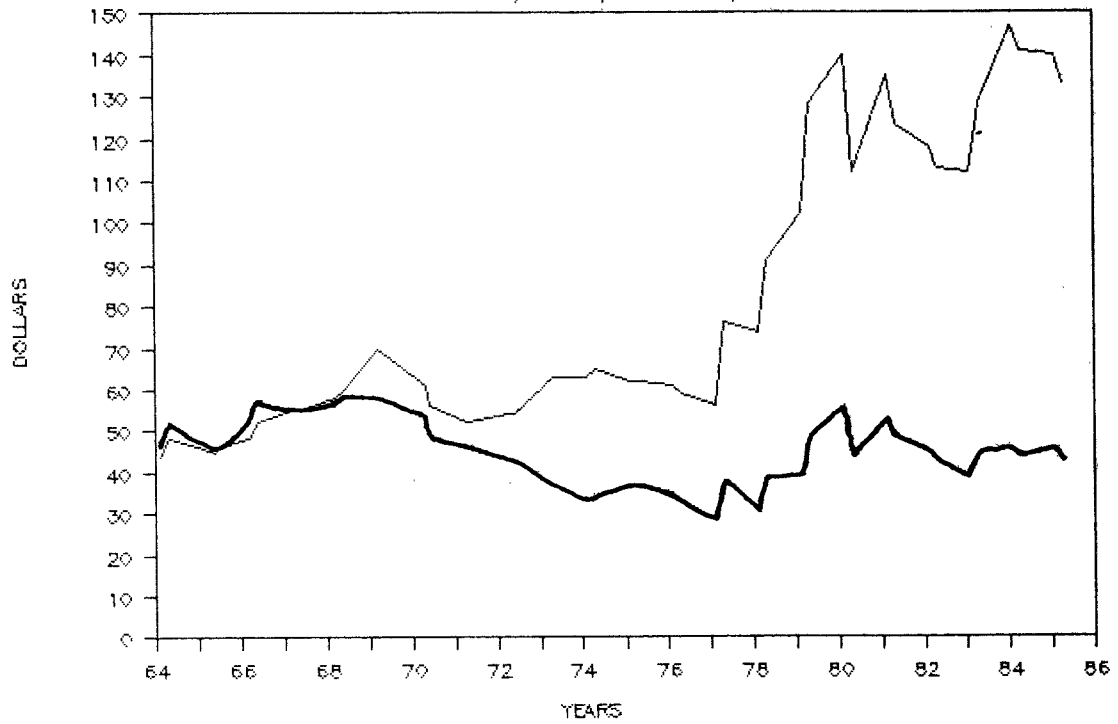
HARD MAPLE STUMPAGE PRICES: OHIO
ACTUAL / REAL (1967 =.100)
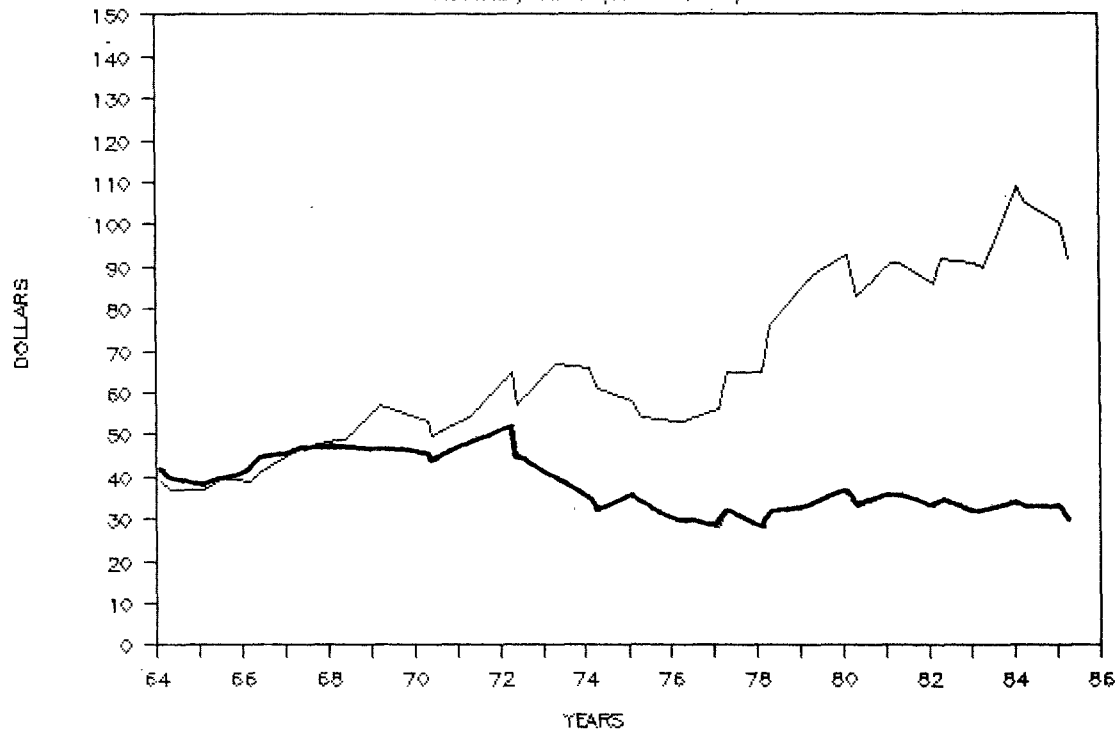
RED OAK STUMPAGE PRICES: OHIO
ACTUAL / REAL (1967 = 100)

15

WHITE OAK STUMPAGE PRICES: OHIO
ACTUAL / REAL (1967 = 100)

SOFT MAPLE STUMPAGE PRICES: OHIO
ACTUAL / REAL (1967 = 100)

16

YELLOW—POPLAR STUMPAGE PRICES: OHIO
ACTUAL / REAL (1967 = 100)

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- Burlington, Vermont, in cooperation with the University of Vermont.

- Delaware, Ohio.

- Durham, New Hampshire, in cooperation with the University of New Hampshire.

- Hamden, Connecticut, in cooperation with Yale University.

- Morgantown, West Virginia, in cooperation with West Virginia University, Morgantown.

- Orono, Maine, in cooperation with the University of Maine, Orono.

- Parsons, West Virginia.

- Princeton, West Virginia.

- Syracuse, New York, in cooperation with the State University of New York College of Environmental Sciences and Forestry at Syracuse University, Syracuse.

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