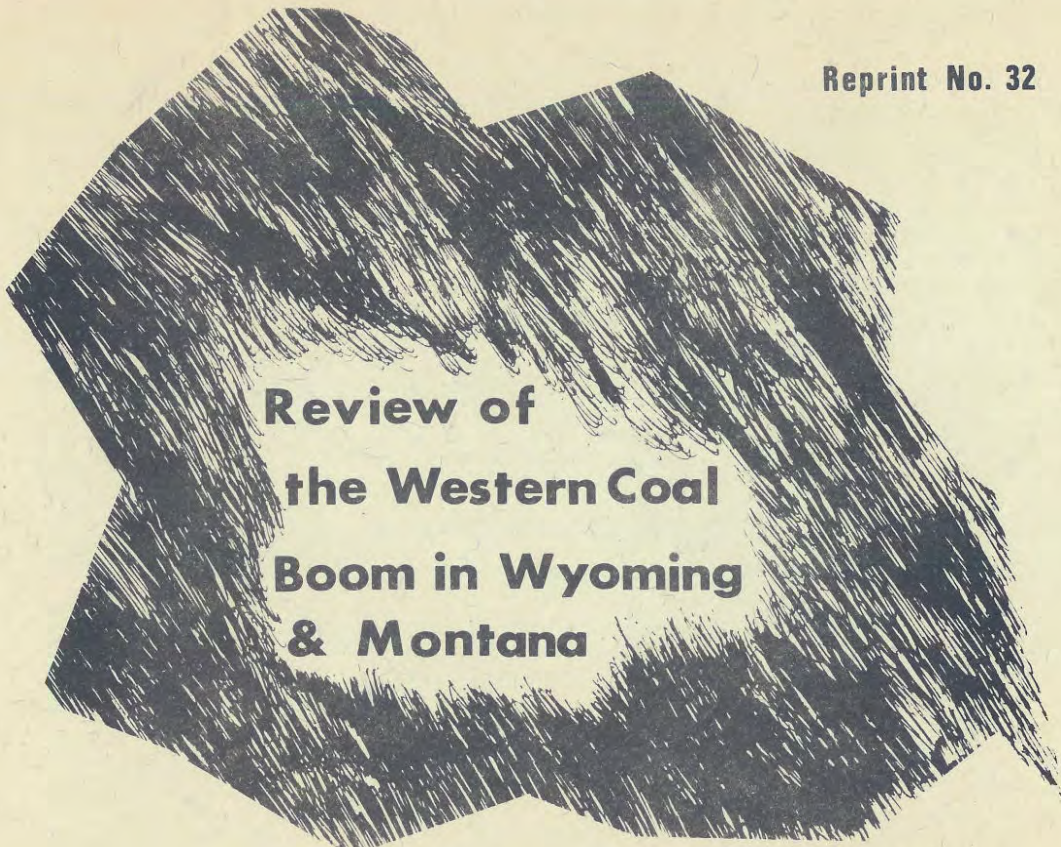


Reprint No. 32



**Review of  
the Western Coal  
Boom in Wyoming  
& Montana**

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Geological Survey of Wyoming

From a speech presented to the Northwest Mining Association's 81st Annual Convention, December 6, 1975, in Spokane, Wash. and at the January 16, 1976 luncheon meeting of the Wyoming Geological Association in Casper, Wyo.

It has been about five years since the coal industries of Wyoming and Montana began breaking annual production records. To illustrate this, similar figures are presented for each state.

Figures 1 and 2 show that each state's annual production increased almost threefold, since 1971. The rate of increase is also about the same, at 31-32 percent per year. The actual tonnages, however, are higher for Wyoming. It increased from eight million tons in 1971 to an estimated 24.2 million tons in 1975. Montana went from 7.1 million to 20.8 million in the same five year period.

Another difference is that Montana's deep mines contributed less than 50,000 tons per year while Wyoming's deep mine tonnage has quadrupled, from 100,000 tons in 1971 to 500,000 tons in 1975.

Of course, this deep mine tonnage is small when compared to strip mine tonnage which accounts for more than 97 percent of Wyoming's production.

Although media reports stress the activity in Campbell County, Wyoming, production is dominated by Carbon County in southern Wyoming. In 1975, Wyoming's Powder River Basin area of north-eastern Wyoming finally matched Carbon County production, if the production from Campbell, Converse and Sheridan Counties is combined (Fig. 3&4).

In Montana, Big Horn County has shown the greatest growth, surpassing Rosebud County in 1974. Figures 5 and 6 show the number of mines in each county of the two states.

Turning now to the total number of mines and their size (Figures 7 and 8), Wyoming has had more mines in any one year than Montana, ranging

from 16 in 1971 to 19 in 1975. In contrast, Montana has had from six to eight mines. The average size of Wyoming's mines is smaller than Montana's with nine mines now producing between one and five million tons per year. Montana has three mines producing between three and eight million tons per year.

Currently eight mines in Wyoming and three in Montana account for 90 percent of the coal production in the two states (Figures 9 and 10). By dividing this number of mines into 90 percent of each state's production, an average large mine in Wyoming is now producing 2.7 million tons per year and an average Montana mine produces 6.3 million tons per year.

#### EMPLOYMENT

What have these large coal mines meant in terms of employment, dollar value, taxes, royalties and rentals?

Employment in Montana's coal mining industry

has more than tripled in the last five years, to at least 600 persons (Figure 11). Wyoming's employment doubled in the same period, to 1550 persons (Figure 12). This was an average annual increase of 35 percent per year for Montana and 23 percent for Wyoming.

Thinking back to annual production, Wyoming's employment is lagging behind the increase in production by about 10 percent per year -- meaning that productivity is increasing. Montana's employment is increasing about three percent per year faster than production. Productivity in Wyoming has risen from 11,000 tons/man in 1971 to 15,000 tons/man in 1975. On the other hand, Montana's productivity is so much higher than Wyoming's that the slight decrease from 36,000 tons/man in 1971 down to 31,500 tons/man in 1975 is hardly significant in a comparison of the two states.

In terms of dollar value (Figures 13 and 14)

Wyoming's coal industry has quintupled in value, going from \$27.3 million in 1971 to an estimated \$133.1 million in 1975. The dollar value of Montana's industry has increased an estimated sevenfold from \$12.9 million in 1971 to \$91.5 million in 1975. I should state that much of these increases in dollar value are a result of inflation, increased taxes and royalties, as well as rising mining and reclamation costs. These graphs are merely meant to show the industry's growth in gross dollar value.

#### TAXES, ROYALTIES AND RENTALS

How have taxes, royalties and rentals changed in this same five year period? Without going into laborious detail, Figures 15 and 16 show that royalties and taxes, in particular, have increased in both states. Over the last five years, Wyoming's coal industry paid over \$25.5 million to the state and/or federal government in direct taxes, royalties and rentals. Montana coal com-

panies paid \$34 million.

Before proceeding, it should be mentioned that Figures 15 and 16 are not directly comparable. While Wyoming's royalties are restricted to those paid to the state and federal government, Montana's royalty figures include those paid to private mineral owners as well.

Figure 16 also shows a drop in Wyoming's bar graph between 1971 and 1973. This marks the beginning of the federal coal leasing moratorium and, consequently, the end of bonus bidding.

Figure 17 shows what the direct taxes are in terms of cents per ton. Although Montana taxes very nearly doubled in the five year period, their new 30 percent severance tax will almost triple taxes from 54¢/ton in 1975 to nearer \$1.50/ton in 1976. Wyoming taxes, which were much lower than Montana taxes to begin with, are still lower even though they have more than quadrupled to an average of 47¢ per ton. No new taxes are certain for

Wyoming at this time, but there are rumors that the severance tax might be raised from the current 4 percent to 5 percent.

Coming back to direct taxes, Figures 18 and 19 give perspective to the total dollar value, valuation, and taxes. The dashed line on the Wyoming graph shows the dollar value in the year that the taxes were based on.

#### MARKETS

Where is all this coal going? Wyoming's current market area is shown in Figure 20 and the combined market areas of Wyoming and Montana on Figure 21. The numbers in the various states are the tonnages going to that state, in millions of tons.

#### PROJECTIONS

What is in store for the future -- a future, incidentally, that grows more difficult to predict each day, as suits, injunctions and government decisions delay or halt new mine openings?

First, the conservative predictions, then a word about pessimistic views.

Montana coal production is expected to increase about 1.5 times in the next five years and top out at almost 43 million tons in 1980 -- an increase of about 11 percent per year (Figure 22). Wyoming is expected to almost triple its production again in the same time period -- going from 34.8 million tons in 1976 to 96.2 million tons in 1980 (Figure 23). Should the Sierra Club vs. Morton injunction or its repercussions last until 1980, it could, conceivably, cut out up to 118 million tons of Wyoming's anticipated production over the next five years. Of course, if the injunction is resolved somewhere within the next five years, which is more likely, this prognosis is overly pessimistic. The stippled areas on Figure 23 show the tonnages that could be affected by the injunction on a year by year basis.

Figures 24 and 25 show a county by county

breakdown of future production. In Wyoming, Campbell County accounts for the lion's share. In Montana, it is about equally divided between Big Horn and Rosebud Counties.

Mine sizes, as shown in Figures 26 and 27, need little explanation, except to note that both states will have many mines in the 5-20 million tons per year range.

Again the number of mines required to produce 90 percent of the tonnage will remain larger for Wyoming at 16 than Montana at three (Figures 28 and 29).

Figure 30 shows the expanded market area for Wyoming coal as projected to 1980. A comparable map for Montana was not prepared, but the market areas are similar with one exception. Montana's coal market is not projected into the southcentral United States (Oklahoma, Arkansas, Louisiana and Texas).

In conclusion, Figures 31 and 32 compare the

cumulative coal production from each state prior to 1971 with a forecast of each state's production between 1971 and 1980. In the case of Wyoming, production in the period 1971-1980 will almost equal 110 years of previous mining. In Montana, production in the same time period will far surpass all previously recorded production for that state.

**Fig. 1**

# MONTANA

193% INCREASE OR 2.9 X  
(AVERAGE 31% PER YEAR)



SURFACE



**ANNUAL COAL PRODUCTION**  
**(MILLIONS OF TONS)**

# WYOMING

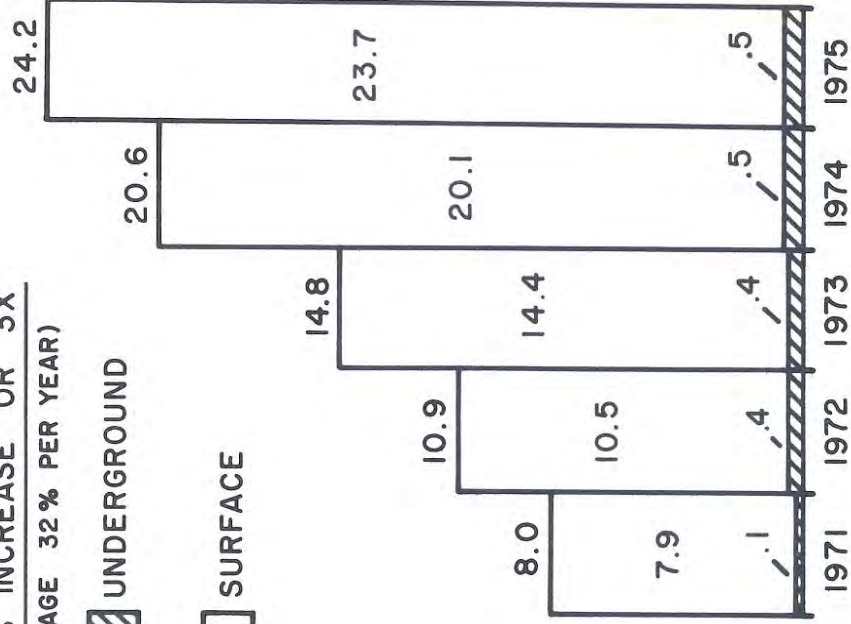
202% INCREASE OR 3X  
(AVERAGE 32% PER YEAR)



UNDERGROUND



SURFACE



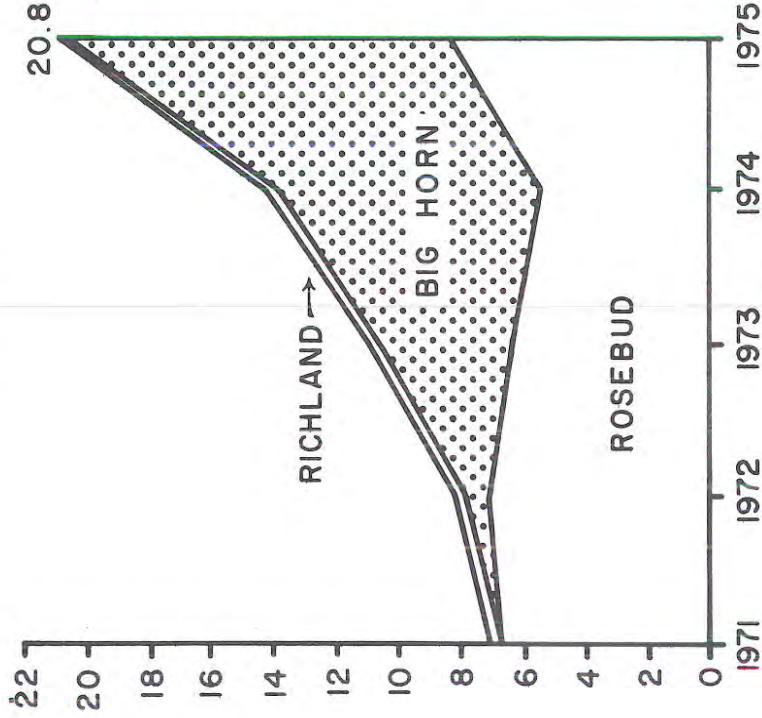
ANNUAL COAL PRODUCTION (MILLIONS OF TONS)

WYO. GEOL. SURVEY, 75

Fig. 2

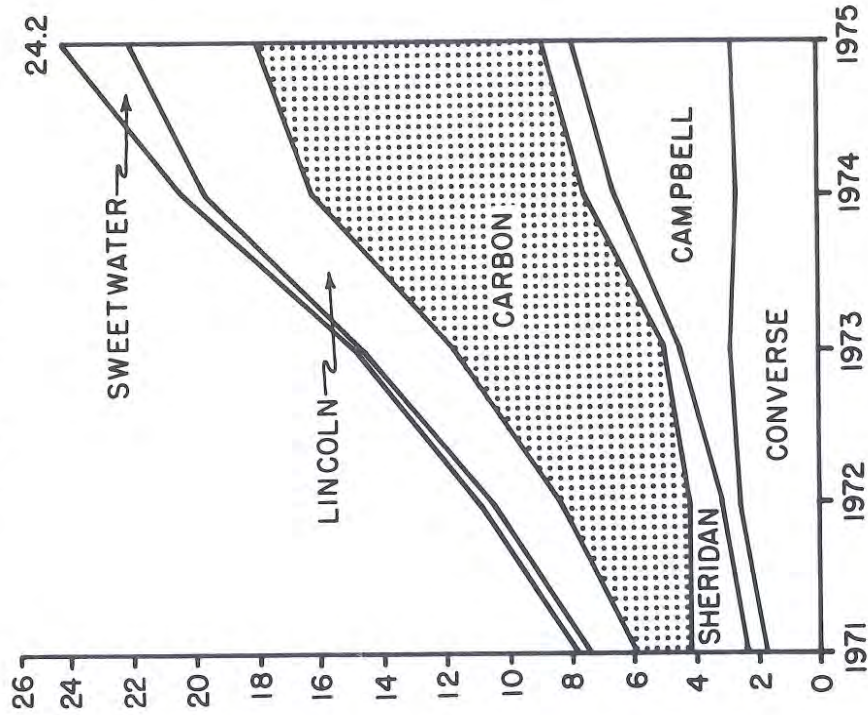


# MONTANA



ANNUAL COAL PRODUCTION BY COUNTY (IN MILLIONS OF TONS)

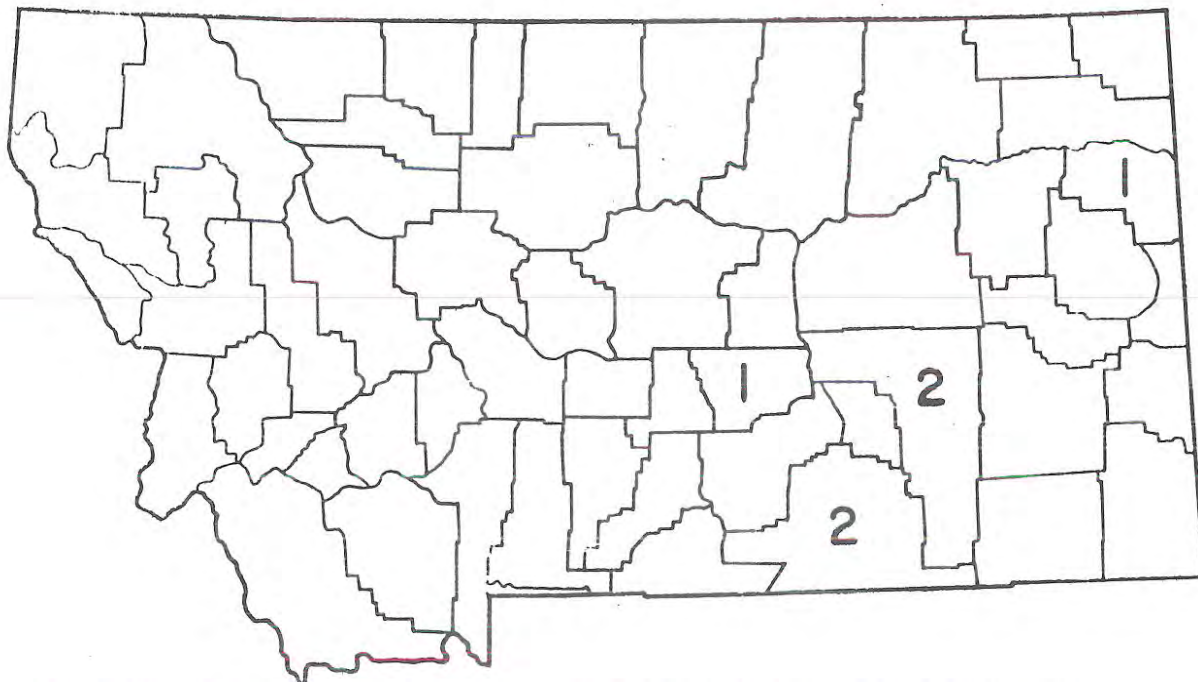
# WYOMING



ANNUAL COAL PRODUCTION BY COUNTY (IN MILLIONS OF TONS)

Fig. 4

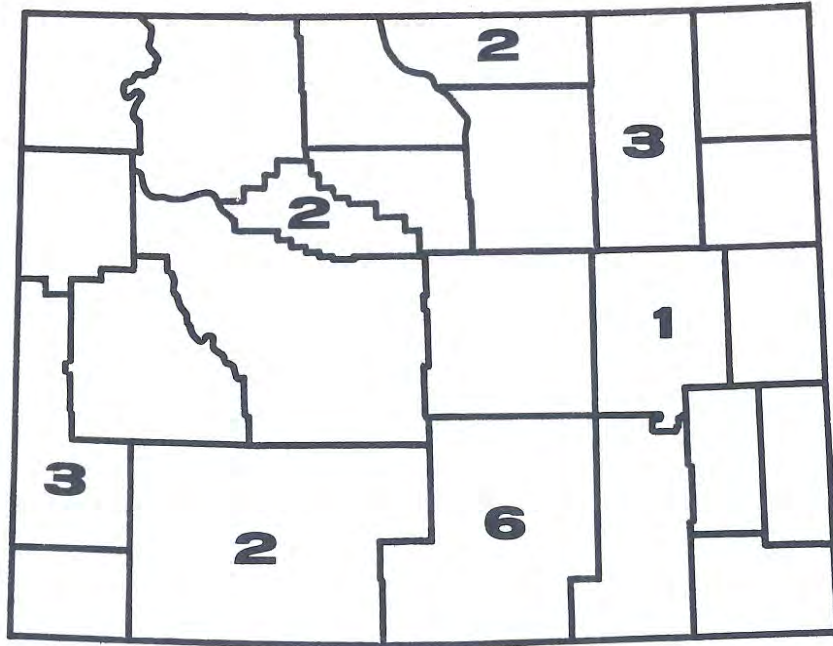
# MONTANA



NUMBER OF COAL MINES BY COUNTY, 1975

**Fig. 5**

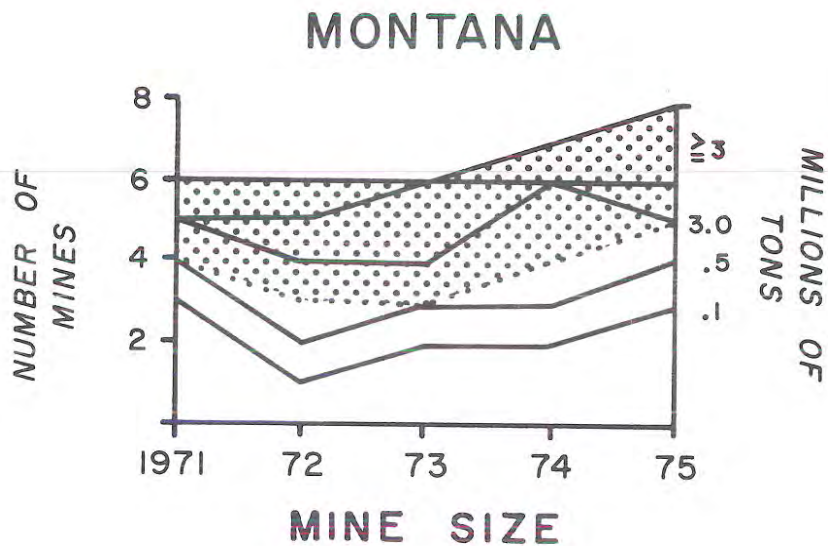
1975



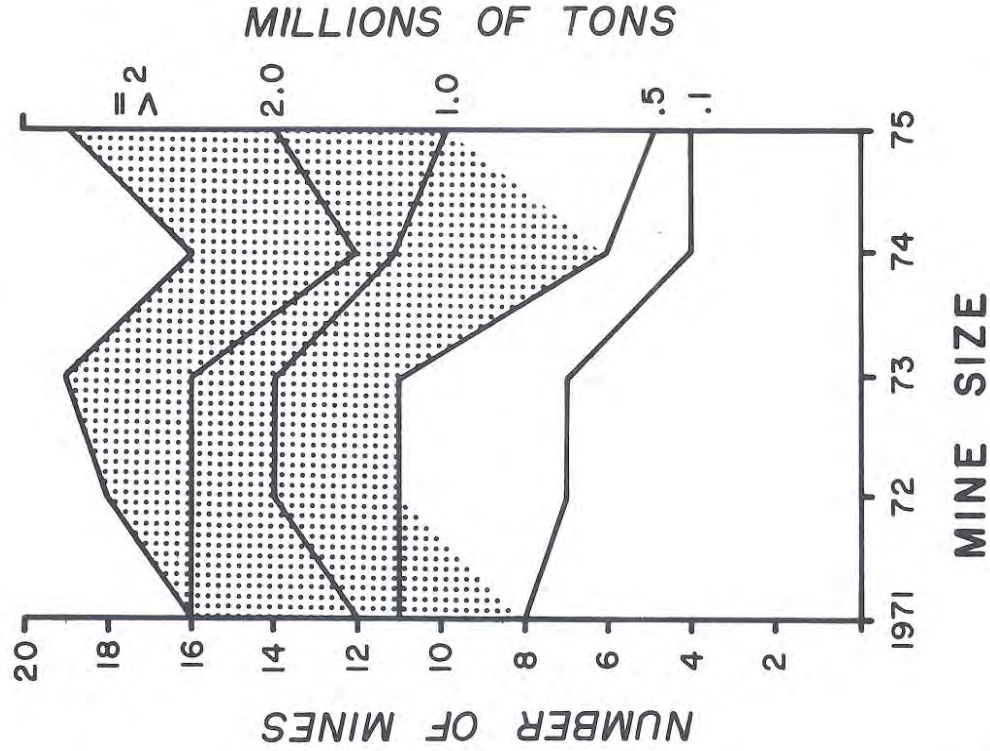
NUMBER OF COAL MINES PER COUNTY

WYO. GEOL. SURVEY, 1975

Fig. 6



**Fig. 7**  
12

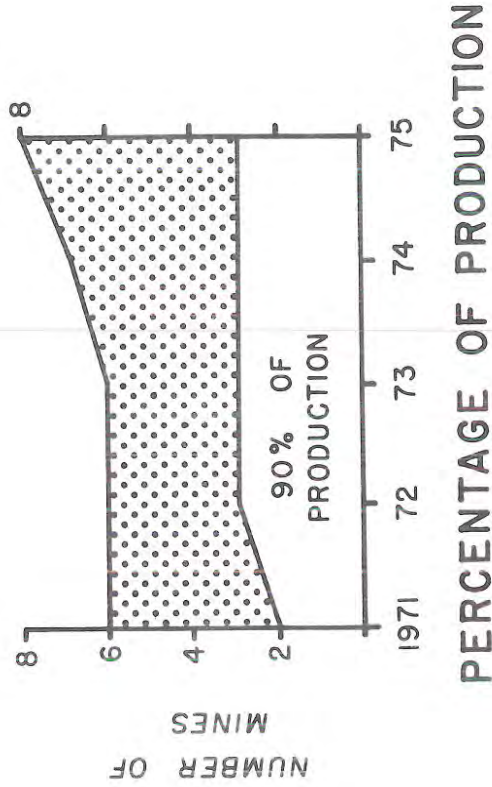


WYO. GEOL. SURVEY, 75

Fig. 88  
13

Fig. 9  
14

# MONTANA



# WYOMING

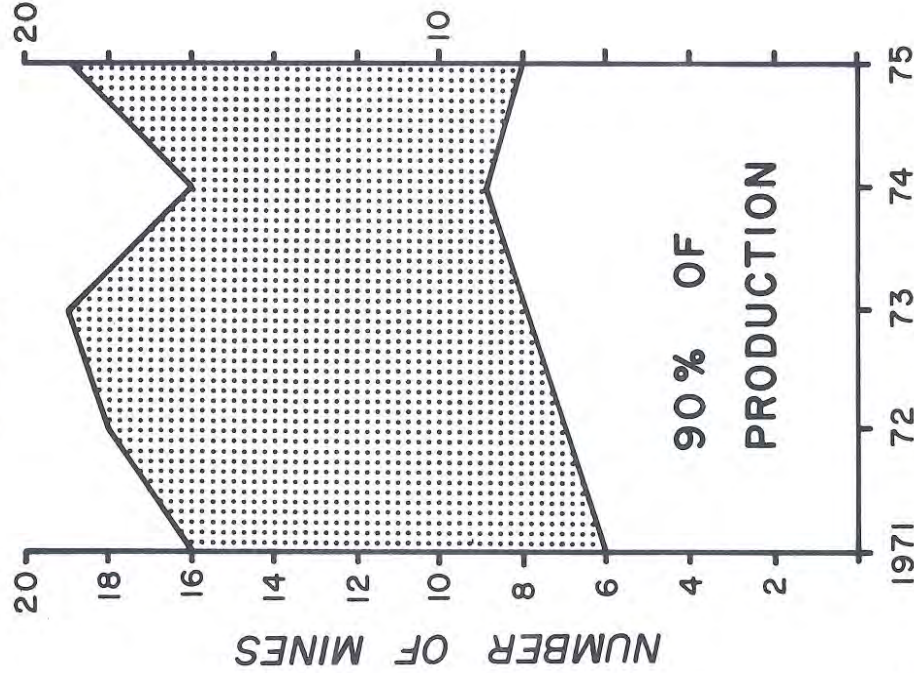


Fig. 10

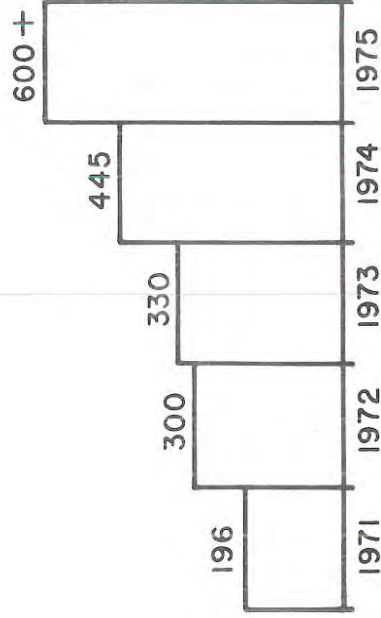


**Fig. 11**  
16

## MONTANA

206% INCREASE OR 3.1 X  
(AVERAGE 33% PER YEAR)

SURFACE



NUMBER OF EMPLOYEES

# WYOMING

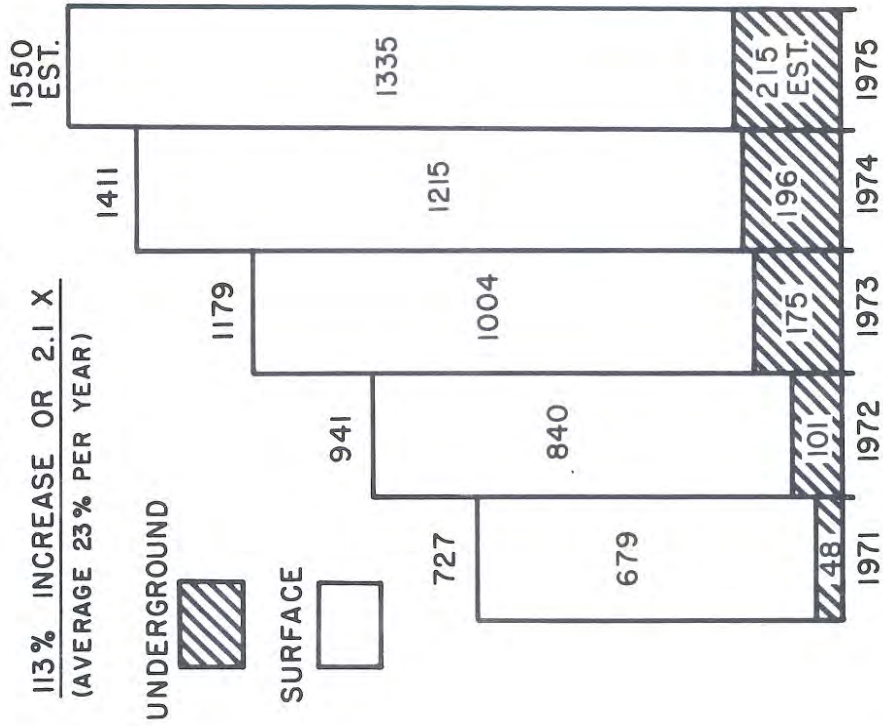


Fig. 12

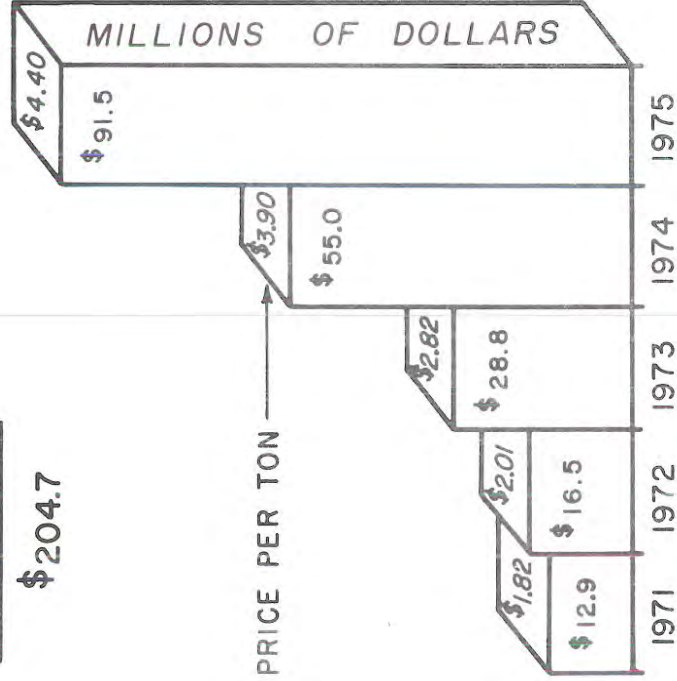
WYO. GEOL. SURVEY, 75

Fig. 13

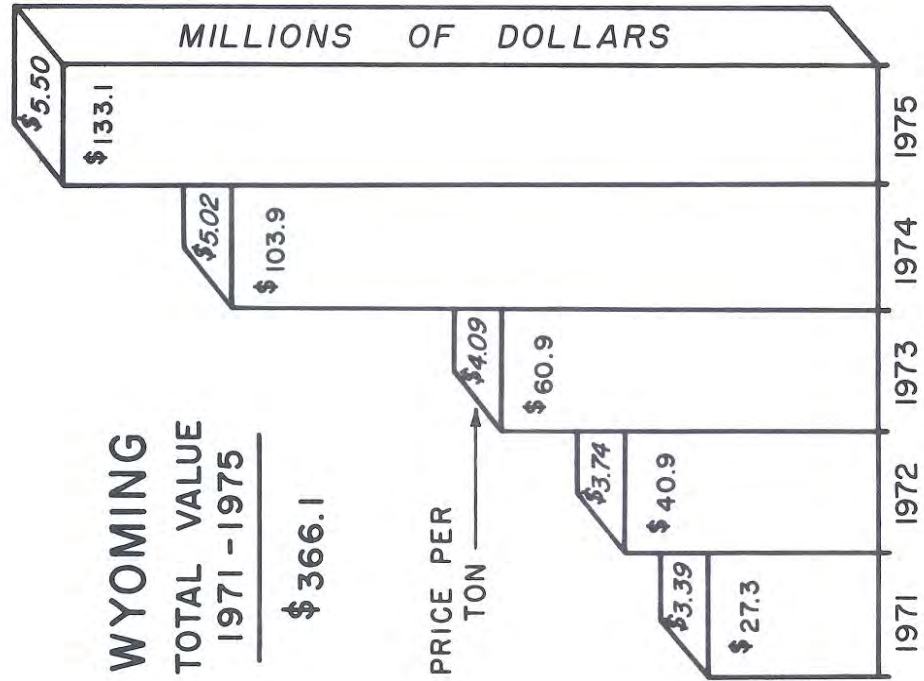
# MONTANA

TOTAL VALUE  
1971 - 1975

\$204.7



TOTAL DOLLAR VALUE OF COAL  
BY YEAR



**Fig. 14**

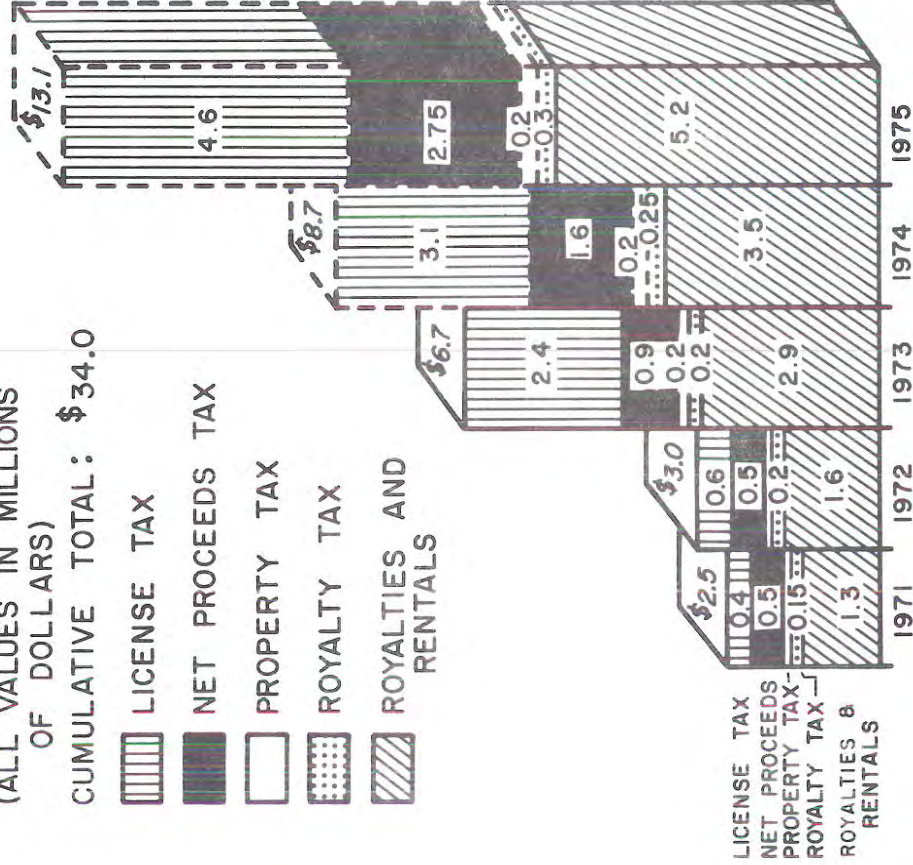
**TOTAL DOLLAR VALUE OF COAL**  
**BY YEAR**

Fig. 15

## MONTANA

(ALL VALUES IN MILLIONS  
OF DOLLARS)

CUMULATIVE TOTAL: \$34.0

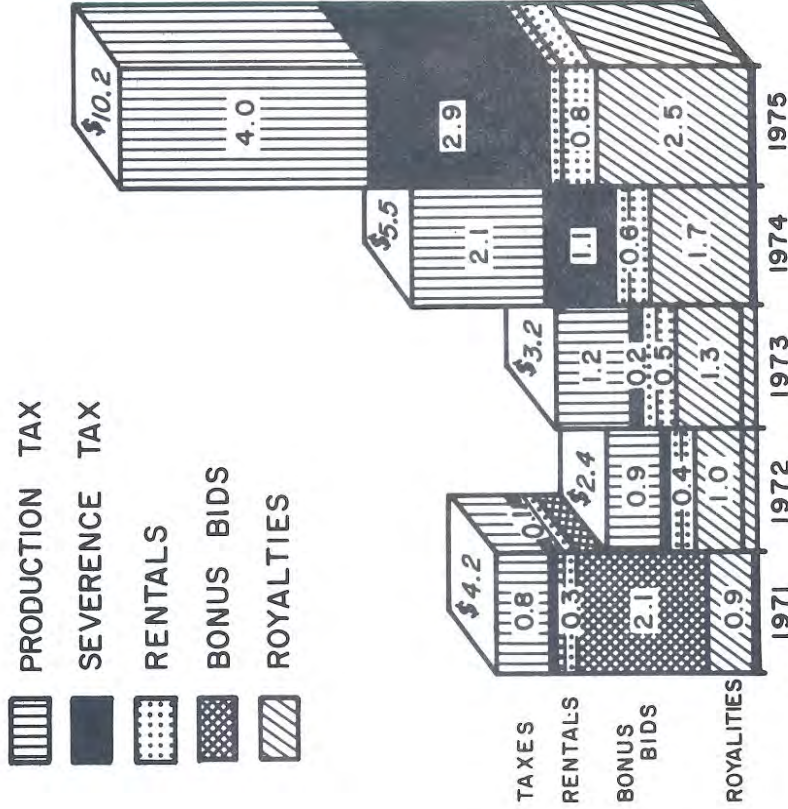


## TAXES, RENTALS AND ROYALTY PAYMENTS

# WYOMING

(ALL VALUES IN MILLIONS OF DOLLARS)

CUMULATIVE TOTAL: \$25.5



TAXES, RENTALS, BONUS BIDS AND ROYALTY PAYMENTS

Fig. 16

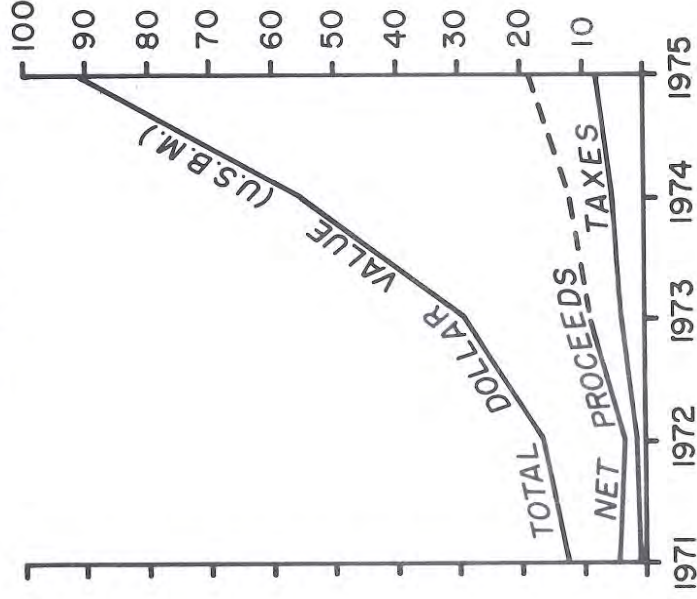
21

	MONTANA	WYOMING
1971	29 ¢	12 ¢
1972	18 ¢	13 ¢
1973	43 ¢	12 ¢
1974	46 ¢	21 ¢
1975	54 ¢	47 ¢

COAL TAXES IN CENTS PER TON

Fig. 17

# MONTANA

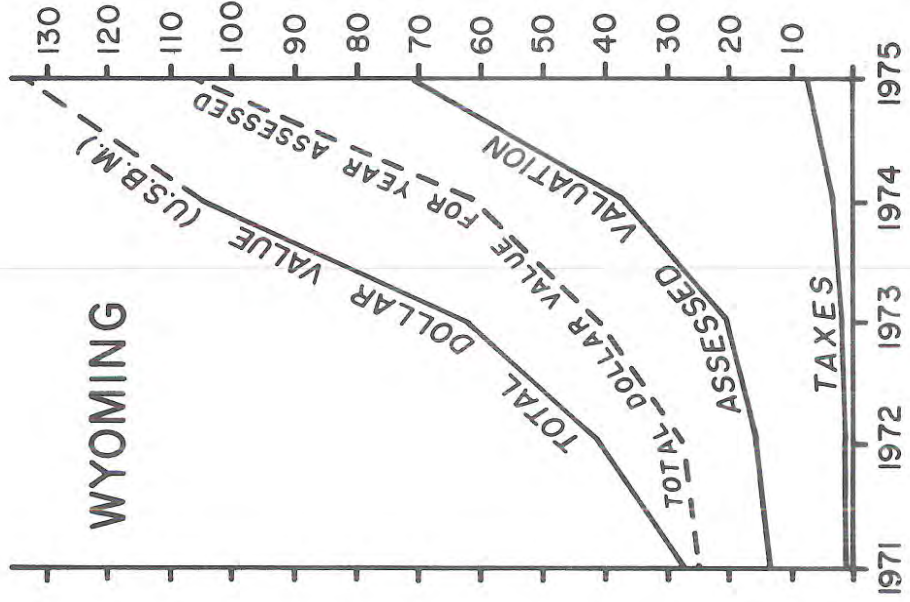


## DOLLAR VALUE, VALUATION AND TAXES

Fig. 18



Fig. 19

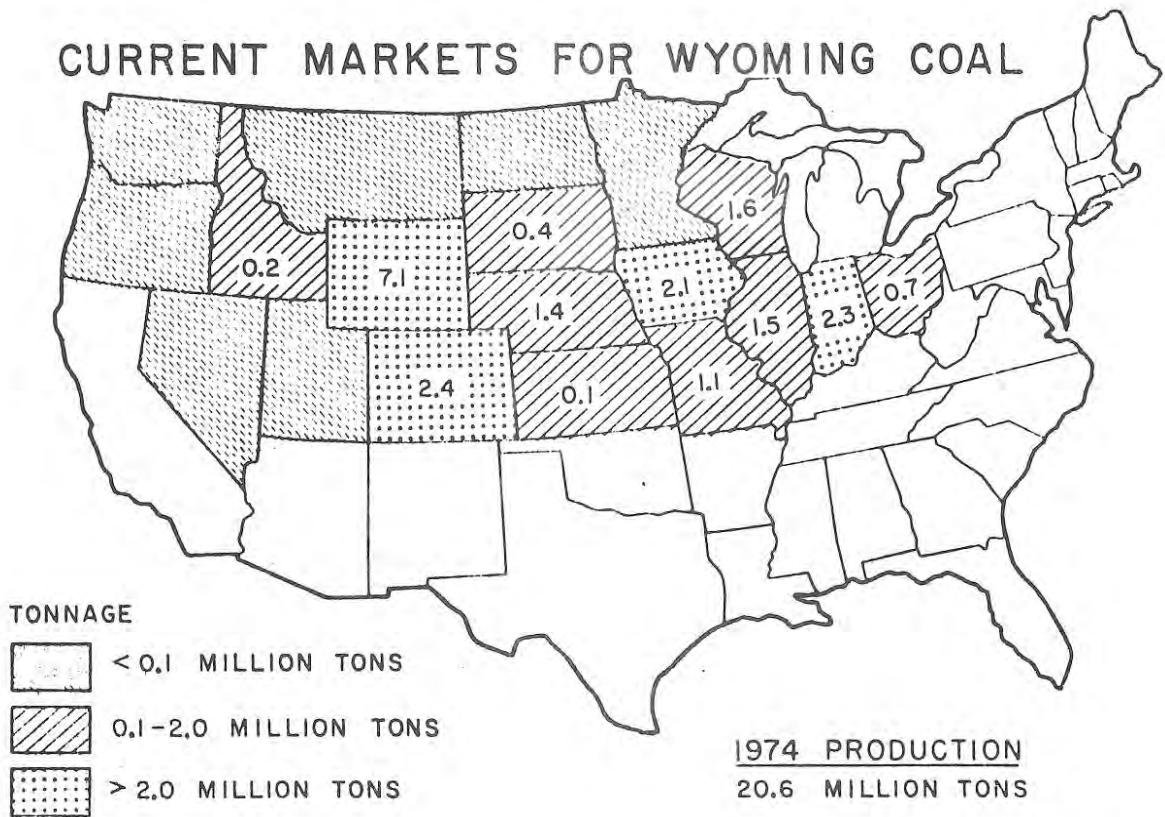


WYOMING

DOLLAR VALUE, VALUATION AND TAXES

WYOMING GEOLOGICAL SURVEY, '75

# CURRENT MARKETS FOR WYOMING COAL



**Fig. 20**

# CURRENT AND ANNOUNCED MARKETS FOR MONTANA AND WYOMING COAL

0.7  
ALASKA

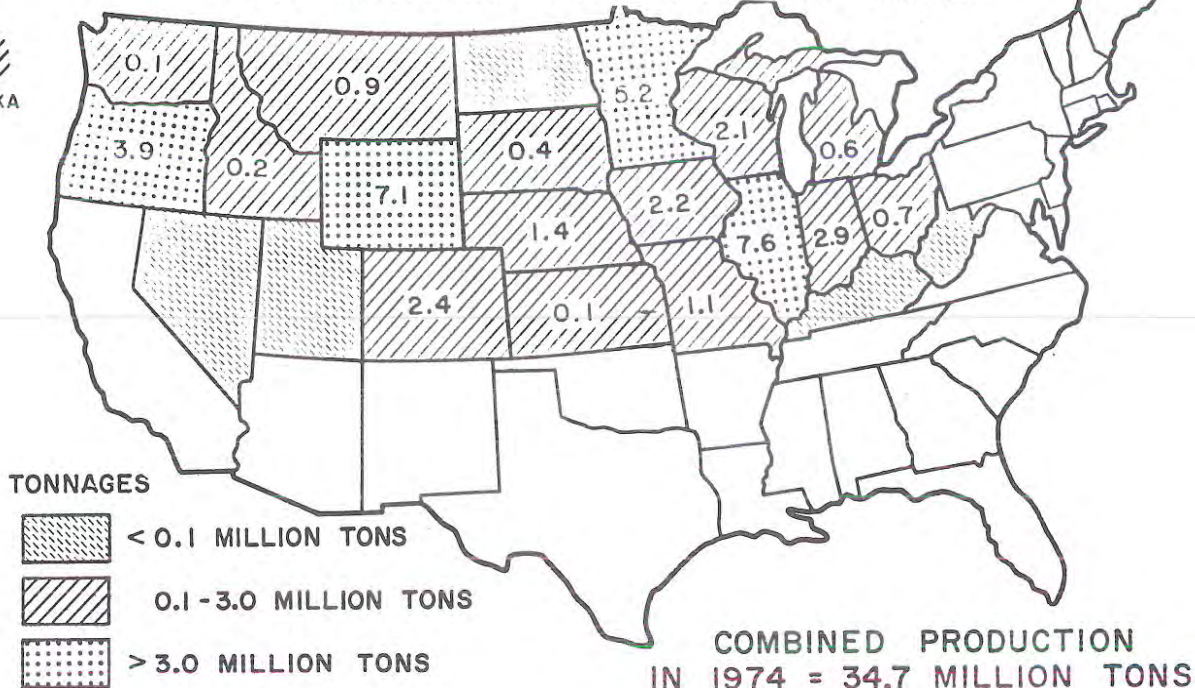


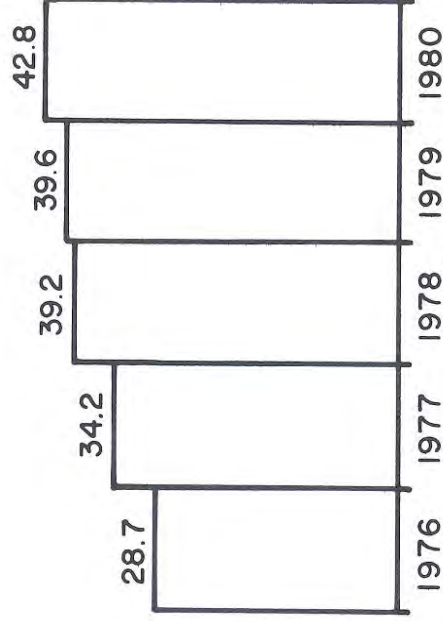
Fig. 21

# MONTANA

49% INCREASE OR 1.5 X  
(AVERAGE 11% PER YEAR)



SURFACE



ESTIMATED ANNUAL PRODUCTION  
BY YEAR (MILLIONS OF TONS)

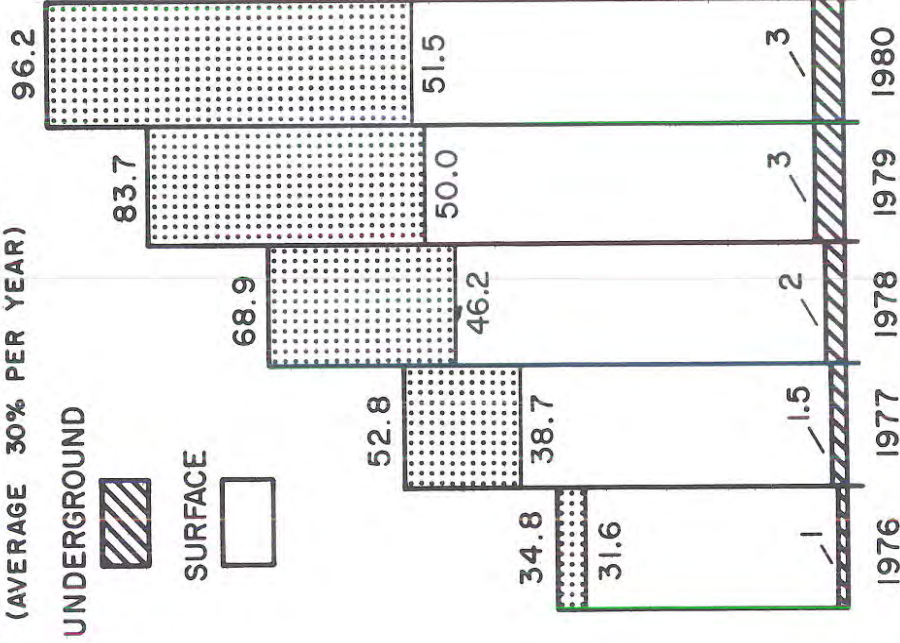
Fig. 22

# WYOMING

28  
Fig. 23

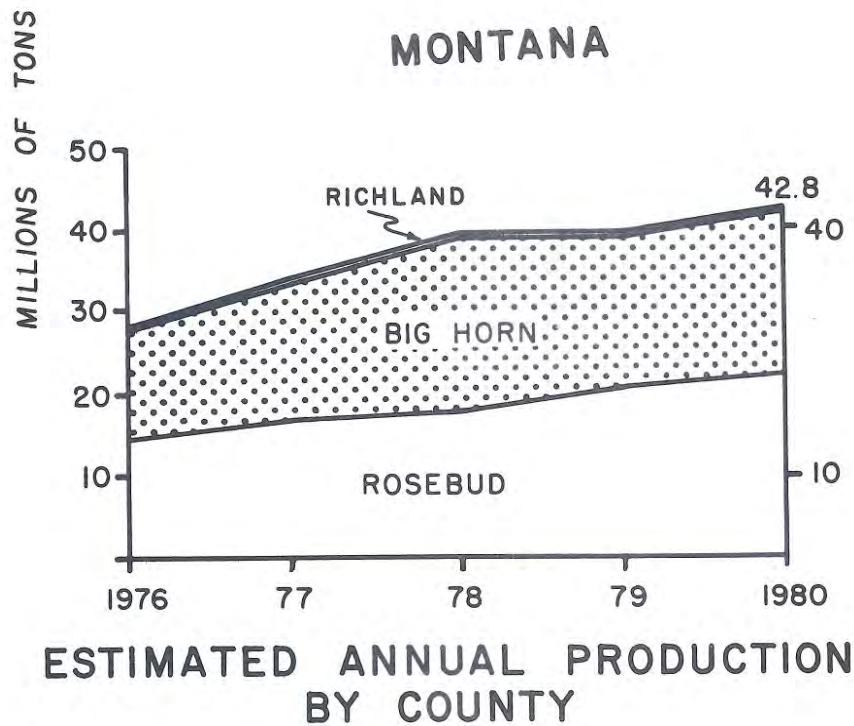
176% INCREASE OR 2.8X

(AVERAGE 30% PER YEAR)



ESTIMATED ANNUAL PRODUCTION  
BY YEAR (MILLIONS OF TONS)

WYO. GEOL. SURVEY, 75



WYO. GEOL. SURVEY, 75

Fig. 24

# WYOMING

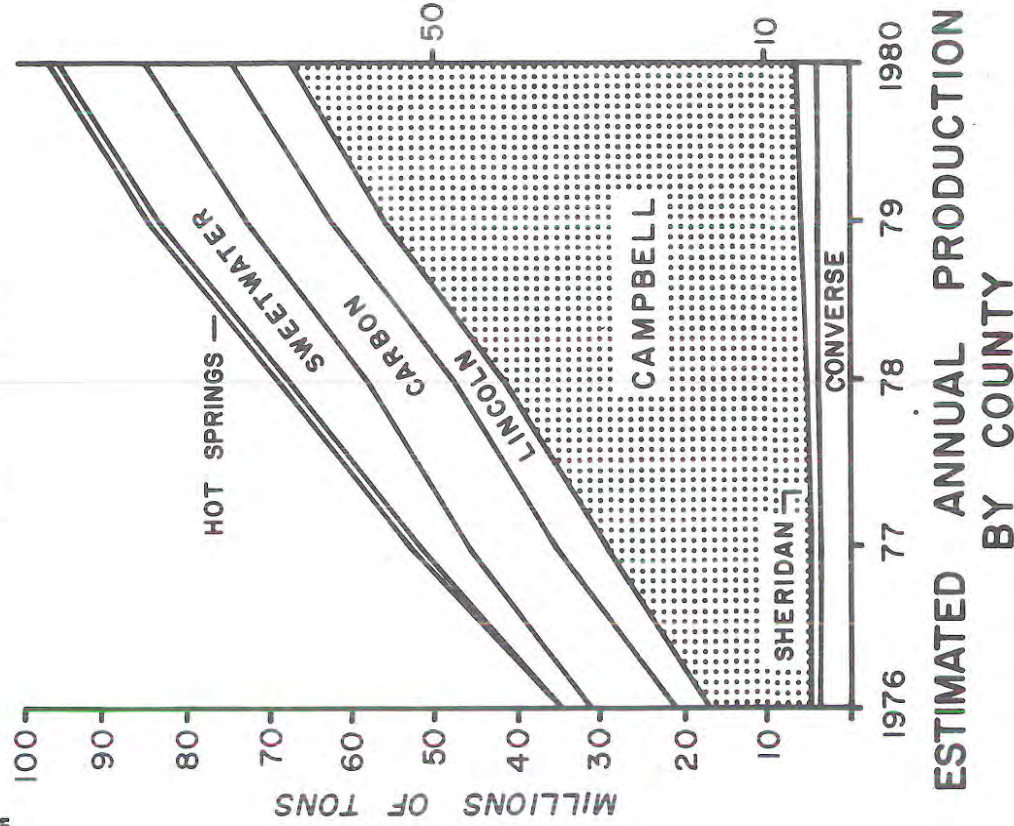


Fig. 25

# MONTANA

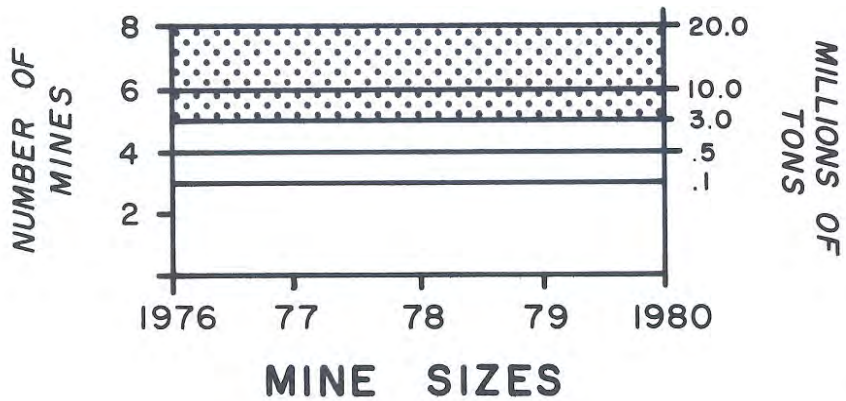
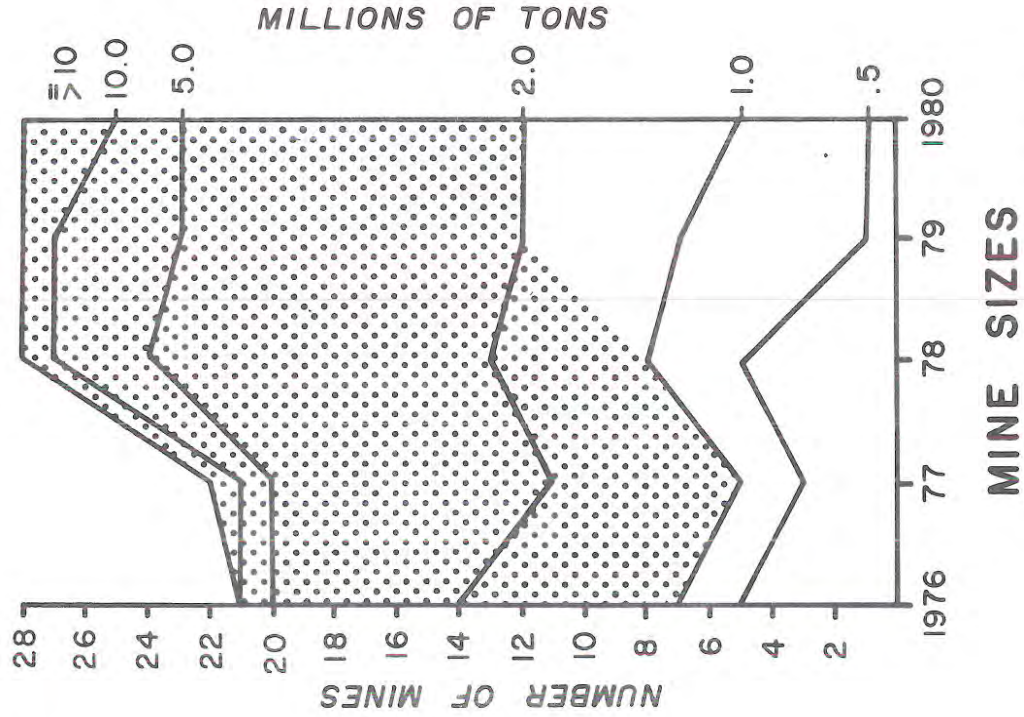


Fig. 26





WYO. GEOL. SURVEY, 75

Fig.27

# MONTANA

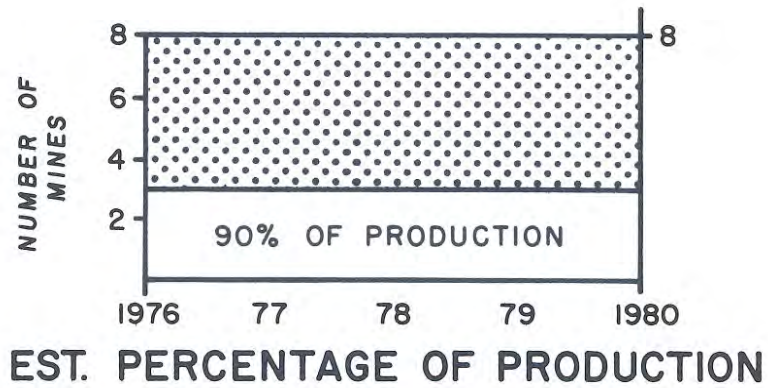
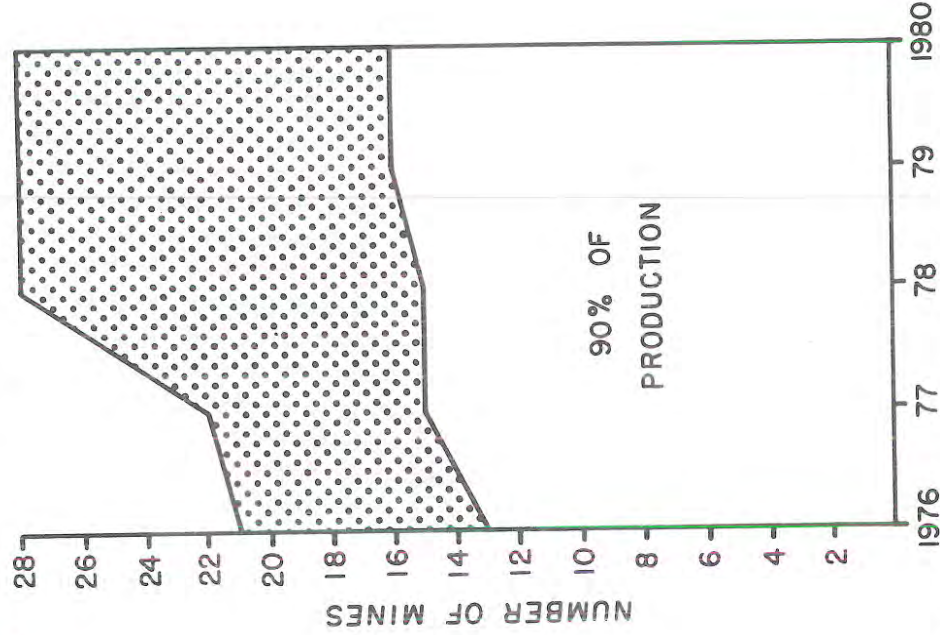


Fig. 28

# WYOMING



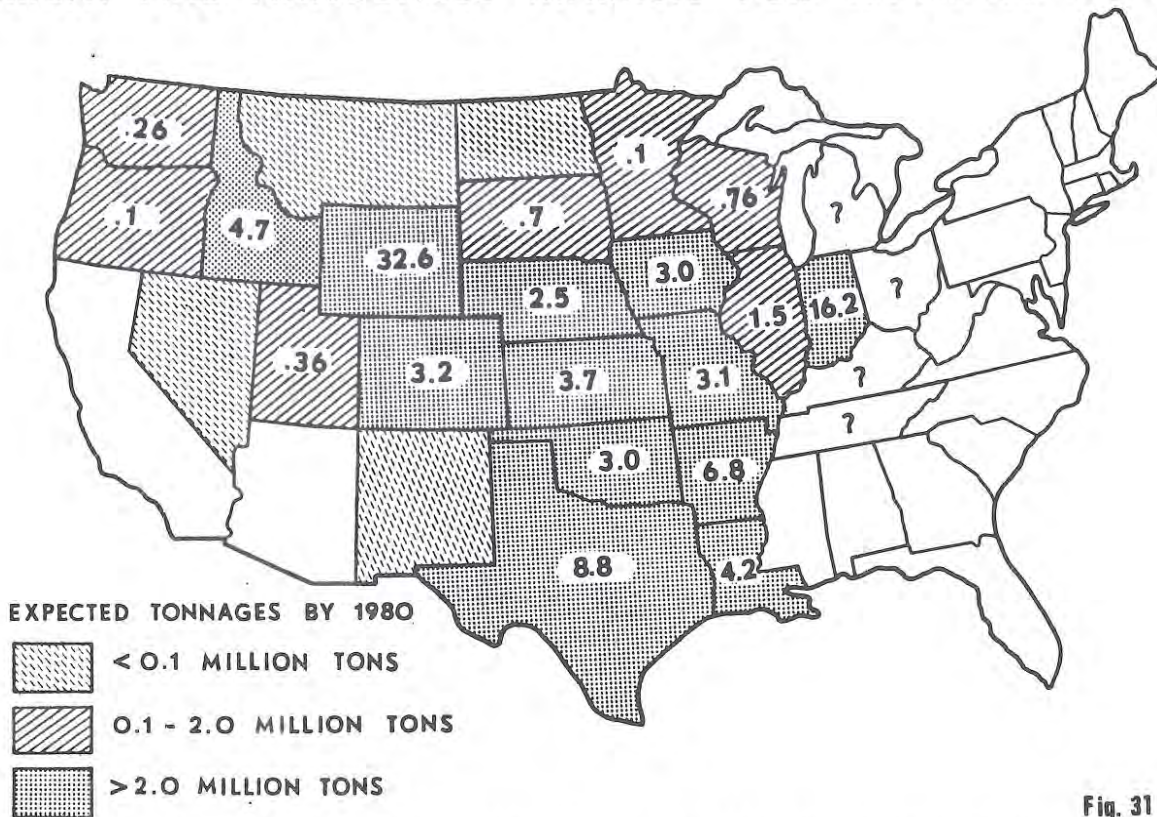
90% OF  
PRODUCTION

## EST. PERCENTAGE OF PRODUCTION

WYO. GEOL. SURVEY, 75

Fig. 29

# CURRENT AND ANNOUNCED MARKETS FOR WYOMING COAL

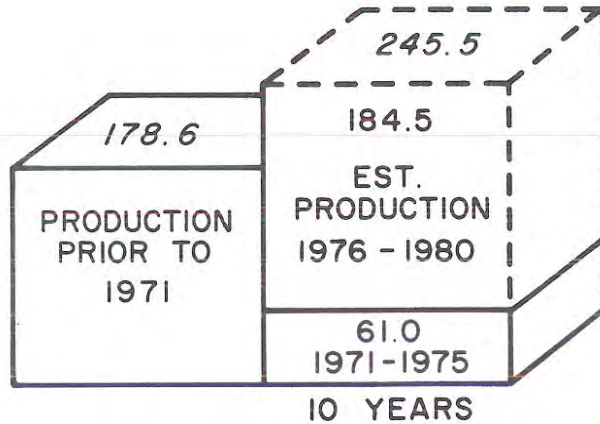


**ANNUAL WYOMING COAL PRODUCTION BY 1980: 96 MILLION TONS**

WYOMING GEOLOGICAL SURVEY, 1975

**Fig. 31**

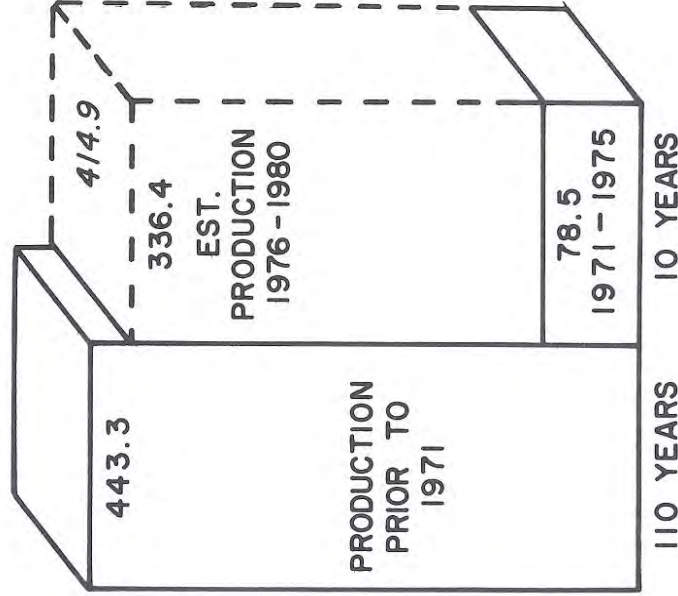
# MONTANA



CUMULATIVE COAL PRODUCTION  
IN MILLIONS OF TONS

Fig. 31

# WYOMING



## CUMULATIVE COAL PRODUCTION IN MILLIONS OF TONS

WYO. GEOL. SURVEY, 75

Fig. 32

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