

## LOWER TUSCALOOSA AND FRIO OF SOUTHWESTERN MISSISSIPPI

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### ABSTRACT

Current drilling activity and recent wildcat successes in southwestern Mississippi illustrate the fact that this region still has attractive potential. The two "plays" of interest are the Upper Cretaceous Lower Tuscaloosa and the Oligocene Frio formations. With the aid of seismic stratigraphy the active companies have increased their geologic understanding and improved success rates; low finding costs make this one of the most profitable provinces for exploration in Mississippi today.

A recent study by Culbertson (May, 1990) examined oil finding costs in Mississippi for the period from 1981 through 1986. The Culbertson model incorporated the following financial considerations: seismic data acquisition, geological expenses, leasing and legal fees, and drilling costs. An average completion cost was assigned to each producing well. Recoverable reserve figures were estimated for oil and gas. A conversion factor of 0.178 was used to convert gas to oil. The finding cost formula divided the total exploration and development costs by the recoverable reserves. Reserves were multiplied by a 75% net revenue interest that accounted for royalty interests and severance taxes; no field operating expenses were included. The present study, which brackets the period from 1986 through 1990, calculated finding costs for the Lower Tuscaloosa to be \$9.12 per barrel. This figure is comparable to the \$6.85 value determined by Culbertson. No previous estimates were calculated for the Frio due to the newness of this trend. This study found Frio costs range from \$0.40/Mcf to \$0.81/Mcf, when assuming reserves of 0.50 Bcf per well to 1.0 Bcf per well.

The Lower Tuscaloosa Trend has been an exploration target since the 1940s when structural fields such as Brookhaven and Mallalieu (Lincoln County) were discovered. Shell's 1981 discovery of Olive Field, through the use of seismic stratigraphy, established that subtle stratigraphic traps could be discerned from modern seismic data. Exploration for these traps now dominates the trend. Since 1986, ten new "strat-trap" fields have been established. Of the 122 exploratory wells drilled, the ten field discoveries resulted in an 8.2% success rate. There were 34 development wells drilled for this period and 25 were completed, for a 74% success rate. Thanksgiving Field was the most significant discovery in terms of size and reserves. Recoverable reserves for the ten fields were estimated to be more than 5,000,000 Bbls of oil and 12 Bcf of gas.

The Frio gas play started at White Castle Field in 1969 and commercial oil began to flow at Stamps Field in 1982. It was not until 1988 that activity picked up when explorationists began to process Tuscaloosa oriented seismic data for shallow gas objectives ("bright spots"). Using the bright spot technique, eight Frio fields have resulted over the past three years. The shallow depths of less than 4000 feet, multiple pay zones, and high exploratory success rates of 60% are just a few attributes of this ongoing play.

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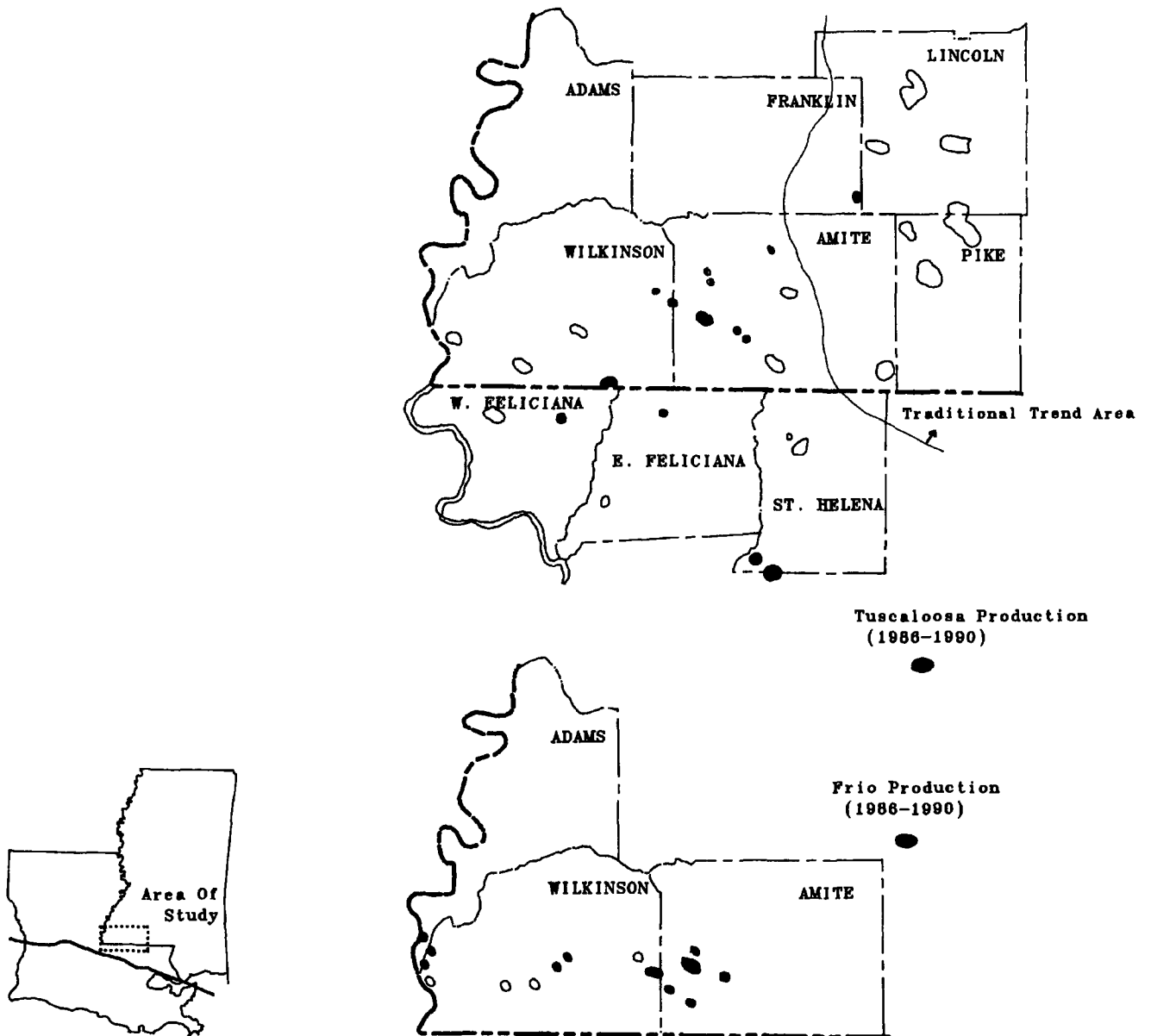


Figure 1. Location of Frio and Tuscaloosa field discoveries between 1986 through 1990.