The Winery Rushing
Sam and Diane Rushing
Post Office Drawer F
Merigold, Mississippi 38759
(601) 748-3821

June 17, 1982

Richard Mascola
BATF
Reserch of Regulation
Washingdon, D.C.

Dear Mr. Mascola,

The purpose of this correspondence is to petition the Bureau of Alcohol, Tabacco, and Firearms to consider establishing a viticultural area in Mississippi named "Mississippi Delta". The proposal is being made by The Winery Rushing of Merigold, Mississippi. We at the Winery Rushing feel that this establishment of th "Mississippi Delta" as an appellations of origin will help consumers of wine to identify better the wines which they may purchase.

The "Mississippi Delta" is referred to in a historical way throughout many referrnces. I have enclosed several copies of books that will bear this out. Among these are copies from the "Delta Council", a few Mississippi history books and a Mississippi Geography book.

From a historical point of view David Cohen said it best when he stated that the Mississippi Delta " begins in the lobby of the Peabody Hotel at Memphis and ends at Catfish Row in Vicksburg." This quotation is found in several sources. One of these sources is the book MISSISSIPPI by the Federal Writer's Project of Works Progress Administration. On the first page it chose to describe Mississippi by beginning with the Delta and its people. Also, in MISSISSIPPI: A HISTORY by John K. Bettersworth, begins his desciption of the Delta by Mr. Cohen's desription that was quoted above here. Basically the Delta is an alluvial deposit approximately 200 miles long and 85 miles wide. The east-west boundries are the Mississippi River on the west and the loess bluffs on the east. The name "Mississippi Delta" is the proposed name that The Winery Rushing will submit because of the historical referrences of this land.

Along with the historical referrences that have been sent are current descriptions which describe the "Mississippi Delta" boundries as land almost totally contained between the Mississippi and the Yazoo River. These soils contain about six million acres. There are eighteen counties in the Mississippi Delta. Ten of these counties are all in the delta. They are Bolivar, Coahoma, Humpheys, Issaquena, Leflore, Quitman, Sharkey, Sunflower Tunica, and Washington. There are eight counties that have some of their acerage in the hills and in the Delta. These counties are Carroll, DeSoto, Holmes, Panola, Tallahatchie, Warren, Tate, and Yazoo. Along with the above description are several maps that will aid in the describing of the physical boundries of the "Mississippi Delta".

The geographical features of the Delta are very easy to see and to describ from the surrounding areas. On the west is the Mississippi River and on the east is the loess bluffs or the hills. The Mississippi River and the hills connect on the north and south so basically we are talking about land made from alluvial deposits verses hill land. The Mississippi Delta is very fertile and highly productive. There are many places with 35 feet of alluvial deposits. These soils are usually rich in organic matter, plant nutients and adapted to a very wide range of crops. Generally cotton, soybeans rice, and catfish are grown in the Mississippi Delta. The topography is generally flat with most soils of the gently sloping phase. The elevation of the Delta is all below 200 feet sea level and has a rough fall of six inches per mile. Upon leaving

the Delta to the west there is a sharp rise as the loess bluffs are entered. These bluffs climb to300-400 feet. Also the vegetation changes from predominently row crps in the Delta to woodlands in the hills. Although there are a few similarities in the crops that are farmed in the hills , these are found primarily in the bottoms as the rest on the terrain will not permit cultivation due to the hilly condistion of theterrain. The topography maps provided will verify this. Thus from the readings and the maps one can see that the geographical features of the Delta allows for a different agricultural enterprizes than that of the Mississippi River to the west and the Loess Bluffs on the east.

The boundries of the Mississippi Delta on the whole has been descussed and shown by maps provided. The part of the whole delta that the Winery Rushing wishes to petition for will now be described . All of this proposed land is within the boundries of the Mississippi Delta. The petitioned land is located in Bolivar county, Mississippi. It is located 3 miles east of Merigold, Mississippi. It is found in T.23N. and R.5W. The desciption will begin at the southwest corner of that land that will be petitioned. The southwest corner is on the Sunflower River Bridge of the Old drew road beginning in the middle of the Sunflower River. From there, the western boundry procedes north along the middle of the Sunflower River to the point in the Sunflower River in which it connects with the northern thirteenth section line. From there the boundry procedes westerly along the 13th section line until it connnects with the the northern 14th section line. Still heading west on the 14th section line the boundry continues until it connects with the center of Beaver Bayou. At the center of Beaver Bayou procede south at the center of Beaver Bayou until it connects with the western boundry of section 24. From that point procede southerly along the western boundry of section 24 until it connects with the Old Drew Road. At this point procede east on the Old Drew Road until yuu connect at the beginning point in the middle of the Sunflower. This is what the Winery Rushing wishes to petition for and with the name "Mississippi Delta". All of this petitioned land is apart of the whole Mississippi Delta and all is the same as the rest os the Delta in that the soils are all alluvial and different from the surrounding hill and the Mississippi River.

We at the Winery Rushing feel that is we are allowed to establish the "MISSISSIPPI DELTA" as an appalation of origin it will help consumers of wine to identify better the wines that they may purchase.

Please accept this correspondence and maps and literature and if there is more information that you need just ask. Thank you for considering this petition.

Sincerely,

Samuel H. Rushing, partner

A HISTORY of MISSISSIPPI

VOLUME I

Edited by

RICHARD AUBREY McLEMORE

JACKSON

UNIVERSITY & COLLEGE PRESS OF MISSISSIPPI

1973

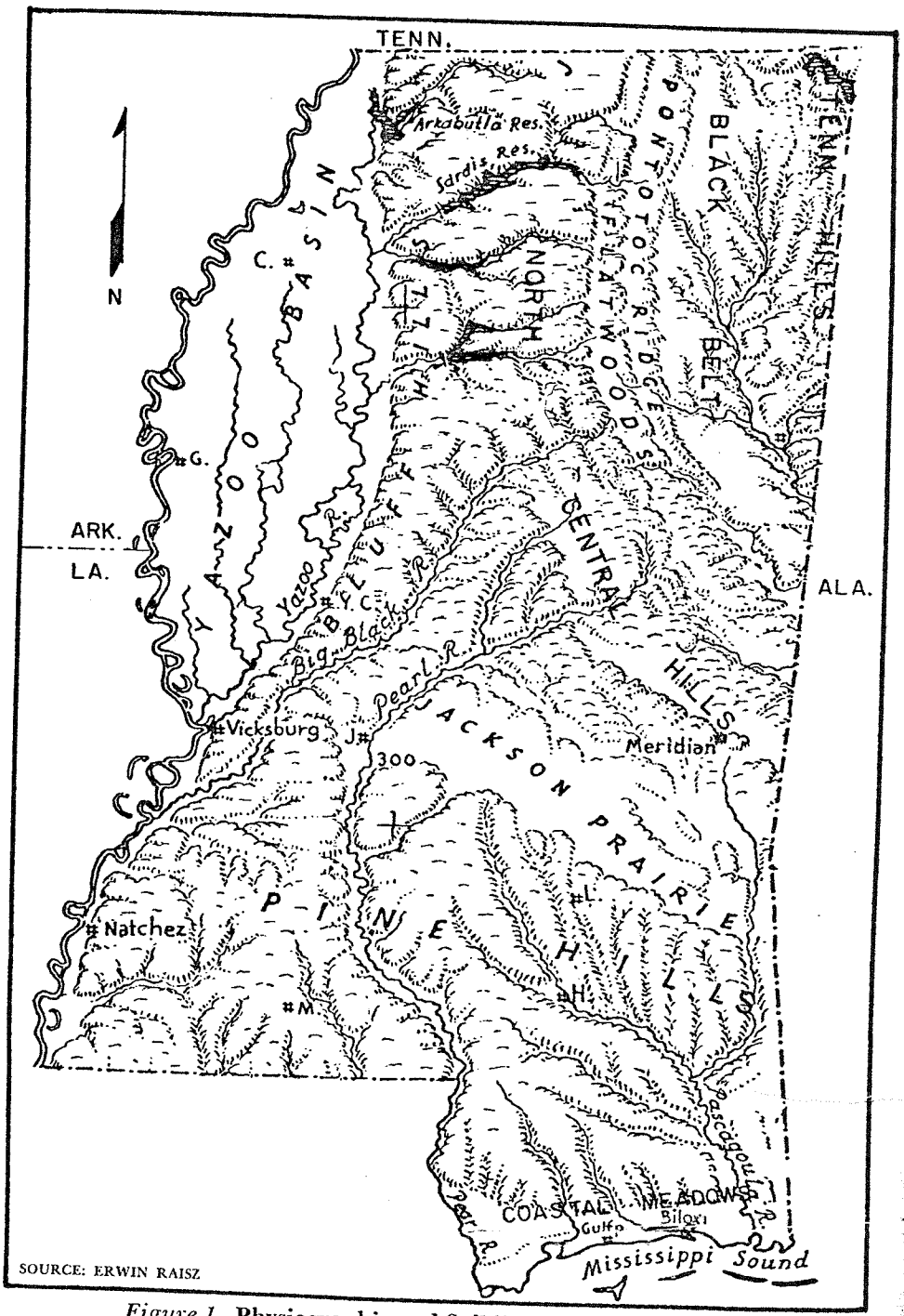


Figure 1. **Physiographic and Soil Regions of Mississippi**

of the North Central Hills in Lauderdale, Kemper, and Neshoba counties is a ridge of the most rugged hills found in the Coastal Plain. This ridge is formed by the very resistant Tallahatta formation and is called the buhrstone cuesta. The local name of buhrstone (burrstone) derives from the presence in the formation of siliceous rock suitable for use as millstones.

Brown Loam and Loess Hills: On the west of the North Central Hills and extending from the Tennessee line to Louisiana is the region known as the Brown Loam and Loess Hills. The western boundary is sharply defined as the Loess Hills drop off to the floodplain of the Yazoo and Mississippi rivers. The region receives its name from the color and nature of the surface materials. The hills along the east side of the Mississippi River floodplain are covered with a thick layer of loess. This material is buff colored, is angular in structure, and has a tendency to stand in vertical columns. It was wind transported from material in the river floodplain. The surface mantle thins eastward over a distance of twenty to forty miles until it blends into the central uplands. Loess is calcareous and fertile but very subject to erosion. The stream banks are vertical, and road cuts must be made vertical or erosion is a serious problem. The loess-brown loam soils produce excellent crops and pasture with proper management.

Yazoo Basin: In the northwestern part of the state, lying between the Loess Hills and the Mississippi River and the Walnut Hills at Vicksburg and the Chickasaw Bluffs around Memphis, Tennessee, is the Yazoo Basin, locally called the Delta. It is a floodplain and is composed of alluvial deposits. It appears almost perfectly flat, but close examination reveals slight elevation along the streams or old meander belts of abandoned streams. As the streams overflowed, the coarse materials were deposited first, resulting in a slight building of land higher than the surrounding area and known as natural levees. The soils of the Delta are dark, rich alluvium, composed of sand, silt and clays. Due to the separating power of water and the age of the materials, the soils of the Delta can be divided into three main types. The first bottom soils are made up of the sandy silt loams of the natural levees. These soils are coarser and better drained than the inter-stream areas, and make highly productive soils. The older meander belts are the second bottoms and have been in position sufficiently long to develop a profile. They contain more clay than the first bottom soils, but are workable and produce good crops. The third bottoms are the poorly drained back swamp deposit and are extremely high in clay content. The soils are fertile but poorly drained, and in dry weather become granular. They are referred to as buckshot lands. Because of the level topography and rich soil, this is the

most productive and extensive agricultural area of the state. About seventy-five percent of the region has been cleared and is cultivated.

Jackson Prairie: In a narrow belt extending from Clarke to Madison County is the physical region of the state known as the Jackson Prairie. It is a flat to undulating area underlain by limestone, marl, and clays of the Vicksburg and Jackson formations. The original vegetation cover was open patches of grassland, interspersed with wooded areas. The underlying materials have resulted in the formation of two major soils in the region. The dark calcareous soils weather from the limestone and marl, and the lighter clay soils are derived from the clay deposits. The dark lime soils, resembling those of the Northeast Prairie, produce good crops and pasture. Sufficient limestone and clay are found in this region to support the cement industry. Plants engaged in making Portland cement are located at Vicksburg and Brandon.

Pine Woods: Extending southward from the Jackson Prairie to within twenty miles of the Gulf Coast, and from the Alabama line to the Brown Loam Belt is the region known as the Pine Woods. The general surface of the area is high and rolling, with moderately high ridges forming the divides between the streams. One hundred feet or more elevation between the hill tops and stream bottoms is not uncommon. The greater part of the area lies between 300 and 500 feet above sea level. The area was once covered with a magnificent stand of longleaf pines, and in times past has been referred to as the Longleaf Pine Belt or Region. The underlying materials are composed of the Catahoula sandstones, Hattiesburg and Pascagoula sands and clays; and, for about eighty miles inland, the hilltops and higher levels are topped with the Citronelle deposits. The top soils are sandy clays, reddish in color on the hills and better-drained areas, and a yellowish color on the flat, poorly drained areas. The Citronelle deposits have weathered into a reddish sandy clay with a trace of calcium. They are well drained, easy to work, and are productive.

Coastal Meadows: Along the Gulf Coast and extending inland from fifteen to twenty miles are the Gulf Coast Meadows. The surface is relatively flat and is composed of recent deposits of fine sand and sandy loams. The soils are gray and yellow, highly leached and poor. The region is mostly devoted to timber growing. Very little agriculture is practiced.

Mississippi, lying between thirty and thirty-five degrees north latitude, is transitional between the tropics to the south and the colder continental climate to the north. This location in the lower middle latitudes is classified as Humid Sub-Tropical, (Cfa according to the Koppen system), and is characterized by warm summers and cool winters. From

MISSISSIPPI: A History

by

John K. Bettersworth

MISSISSIPPI STATE UNIVERSITY

The Steck Company *Publishers* Austin, Texas

Politically, the Gulf Coast has always been a minority section, thereby forcing its legislative members to make alliances with leaders from other areas in order to realize desired political objectives. Its rapid growth in population since World War II has caused the Gulf Coast to campaign vigorously for legislative reapportionments, whereby its political influence might be increased.

The Delta. A famed Mississippi writer, David Cohn of Greenville, originated the well-known quip that the section of Northwest Mississippi known as "the Delta" begins in the lobby of the Peabody Hotel in Memphis and ends in Catfish Row in Vicksburg. Certainly the people of the Delta, white and black, move about for most of their lives within these two geographical boundaries.

The world is full of deltas, but to Mississippians there is only one. Geographers call it the Yazoo-Mississippi Delta. It is a fertile wedge of land 200 miles long, sometimes as much as 85 miles wide, reaching down through 35 feet of alluvial soil deposits. It is the product of the mingling of the waters of the great Mississippi River and the smaller Yazoo River and its tributaries.

Not a riverful of water flows into the Mississippi all the way down its east side from the Tennessee line to Vicksburg, but the torrent that seasonal floods can build up in the Yazoo basin can flood a large part of the Delta; and when the Mississippi itself used to go on a rampage, there was not much Delta land left in sight. Now the Delta is safeguarded by levees, but there was a time when floods were frequent and devastating. However, with the flood waters came good Yankee soil from up the great river and good Mississippi soil from the Yazoo headwaters to make the Delta soil richer.

The first settlers in Mississippi longed to exploit this rich gift of the two rivers, but only a few portions of the Delta area could be safely cultivated until the levees began to be built in the 1850's. There have been floods since then—the last disastrous one as late as 1927—but the Delta has grown rapidly in the last hundred years. Today it is something unique, not only in Mississippi but also in the South.

Nature fashioned the Delta for large-scale agriculture—for the plantation. That is how the Delta began; that is how it continues to be. In slavery days it developed its characteristic pattern of a wealthy landowning class depending upon a huge labor force to

produce the prize crop of the Cotton Kingdom, long-staple cotton.

Today the plantation persists. The Negro who was once a slave now works for hire, though he has continued to depend upon his "white folks" for his keep. There have been times when the Negro joined waves of migration to Chicago and other points north. Once the resulting loss of labor disturbed the planter greatly; but now the departures for the North are not so critical as they once were, for, as the Negro has begun to move out, the machine has moved in.

In the Delta the machine has learned to do nearly everything that common labor once did. Mechanization has revolutionized the Delta's agriculture, so that the plantation is like a factory except that it lacks the roof and smokestacks. The planter no longer has to round up his labor in the morning; all that he has to do is crank it up. The machine has converted the plantation from mule- and Negro-power to horsepower. While Delta cities used to be hardly more than trade centers and cotton markets, they now are trying to get factories. So, on the farm or in the town, the machine has come to stay. Except for its machines, however, the Delta has not changed much. It may alter its processes of making a crop; it has always kept its distinctive way of living, as all Mississippians know.

Deltans are rich; they live well. But they can also be what we call "land poor." Cash is something the average Deltan possesses only because he has credit—credit at the bank; for the banker has to advance the money for the crop year before a single cottonseed can be put into the ground. With the planter's borrowed funds the system goes full speed ahead. All down the line "advances" are made to sharecroppers and tenants—to all of those who depend upon the planter's funds to operate. And since nobody, from the planter on down, really has much cash money to throw around, nobody seems to worry about the fact that big debtors have little debtors upon their backs to bite them. So life goes pleasantly on.

Deltans have access to money, and they do not hesitate to spend it. Social life in the Delta tends to be gay; Deltans lack few of the good things of life. The cultural element is not forgotten, either. Delta folk spend considerable money getting educated. They dance and frolic, but they also read books and write them. No Delta year is complete without a series of trips to Memphis, whose hotels, department stores, and amusement facilities speak with a Mississippi drawl. Some Mississippians resent the Delta money that flows up-

stream into Tennessee and complain that Memphis has just about made itself the capital of the Delta. Yet, in recent years, Jackson has won a fair share of the Delta trade.

Politically, there is no question as to where the capital of the Delta is, for the Delta has always played a prominent role in the government at Jackson. Not that the section has a large vote, for it does not; but Delta political leaders have a knack of getting re-elected, while in other parts of the state there is much rotation in office. Thus experience tends to develop leadership and seniority, and Deltans rise to the top in state government. Generally Deltans are inclined toward conservatism in politics, a condition which befits the Delta's aristocratic background.

Despite the fact that the men from the hills may sometimes dislike the Deltans, the Deltans know how to make political friends. For years they joined with the small hill farmers of North Mississippi to keep that section in the political saddle by outvoting South Mississippi. Now that the southern section has grown more powerful in politics, the Delta at times joins with the political forces of the Gulf Coast and the Natchez area to deal defeat to the hill sections.

So the Delta will not be overlooked. The rest of the nation is inclined to think of all Mississippi as if it were like the Delta. Broad plantations, Negroes crooning spirituals and "blues," and flood waters running all over the place are imagined by the "foreigners" of Hollywood and in the North to be all that Mississippi is made of. Mississippians know better; and Deltans know that this is not even an accurate picture of the Delta.

The Loess Bluffs. Eastward from the Delta one climbs suddenly into hills, or rather, bluffs. These bluffs, varying from five to fifteen miles in width, stretch southward toward Vicksburg and tower above the narrow Mississippi River lowlands all the way to Natchez and the southwestern corner of the state. Loess bluffs are what we call these highlands, upon which prehistoric dust storms piled layer after layer of rich surface soils from out West. These loess deposits vary from thirty to ninety feet in depth. Cut by erosion, the rugged areas offer considerable impediments to cultivation but are excellent for livestock grazing. Present-day builders of highways find their engineering skill and the state purse seriously taxed when highways have to be cut through or thrown across these heights.

THE DELTA LOOKS FORWARD

An Inventory of Natural and Human Resources

ROBERT BAKER HIGHSAW
Director of the Bureau of Public Administration
University of Mississippi
and
Research Consultant to the Delta Council

DELTA COUNCIL
STONEVILLE, MISSISSIPPI
1949

affect the mixture of natural and cultural patterns which constitute the environment of modern life.

Resources, then, are those parts of environment upon which the people of a given area depend for aid and sustenance. It is in this sense that the term is here employed. Six natural resources of the Delta are examined in the following pages. These are: (1) Soil and agricultural resources; (2) water resources; (3) forest resources; (4) minerals; (5) wildlife; and, (6) scenic and recreational resources. In addition three factors of a social nature which relate to the development and utilization of natural resources are also reviewed. These are, in order, population and labor, transportation facilities, and governmental mechanisms.

Accordingly, subsequent chapters attempt an analysis of these nine subjects. Some resources are explored more thoroughly than others; some of them are more important for the Delta than others. It is not too much to say, for example, that the life of the Delta depends upon the proper management of its soil while a similar statement cannot be made for wildlife or mineral resources. This is merely to argue that there is currently a hierarchy of resources values there as elsewhere. Yet a general analysis of resources affords significant possibilities for continued survey of specific resources problems; and the obvious interrelations which appear in any resources study should provide a foundation for formulation of future resources policies.

WHAT IS THE DELTA?

A common definition of the word "Delta" is the triangular mouth of a river formed by deposits of alluvium. Two exceptions from this definition are found in the case of the Mississippi Delta. First, this report deals with an alluvial plain formed by deposits several hundred miles above the mouth of the Mississippi River. Second, we are concerned here only with the portion of the alluvial plain east of the Mississippi River; the resources of the region west of the river, lying within the territorial boundaries of Arkansas and Louisiana, are excluded from our consideration.

Among the 18 counties whose resources are scrutinized, moreover, only 12 are located predominantly in the Mississippi Delta. These counties are Bolivar, Coahoma, Humphreys, Issaquena, Leflore, Quitman, Sharkey, Sunflower, Tunica, Warren, Washington, and Yazoo. The remainder are part-Delta counties—Carroll, DeSoto, Holmes, Panola, Tallahatchie, and Tate—their territory merging with the hilly sections of the state to the east.

Division of Delta counties thusly creates some difficulties in the statistical summary of particular resources. For example, it has been necessary to include agricultural material for the whole of the part-Delta counties in the absence of breakdowns by beats. Much the same situation prevailed with respect to population and labor figures. This necessity has resulted occasionally in distortions of a minor character which, however, are not so great as to invalidate the whole.

THE DELTA AND AN INTERDEPENDENT WORLD

Study of the resources of a single area cannot be assumed to emphasize the self-sufficiency of the region under analysis. One of the most striking developments of today is the interdependence of regions and nations. It is in this interdependent world that the resources of the Delta are set.[2] The Delta, especially because of its tremendous production of cotton, reflects this joint dependence to an unusual degree.

No equal relationship exists between the Delta and the centers such as New York, Pittsburgh, Chicago, and San Franciso, which possess great political and economic power.[3] Like other regions which produce chiefly raw materials, the Delta has not kept step equally with these great centers and differs from them in the strength, wealth, and power it can muster.

This development means that the Delta does not now and will probably never possess economic independence. Since it does not, the resources of the Delta must draw their significance at least in part from the interplay of broad national and even international forces. The dependence of the Delta on outside areas cannot be escaped.

Thus cotton in the fields without the knowledge, effort, and equipment required to grow it, harvest it, sell it, process it, mar-

[2] Compare with Erich W. Zimmerman, "What We Mean by Resources" in *Texas Looks Ahead* (Austin: University of Texas, 1944), Vol. I, pp. 2-3.

[3] *Ibid.*, p. 3.

$1.35

MISSISSIPPI

A GUIDE TO THE MAGNOLIA STATE

Writers program

Compiled and Written by the Federal Writers' Project
of the Works Progress Administration

AMERICAN GUIDE SERIES

ILLUSTRATED

Sponsored by the
Mississippi Agricultural and Industrial Board

HASTINGS HOUSE · *Publishers* · NEW YORK

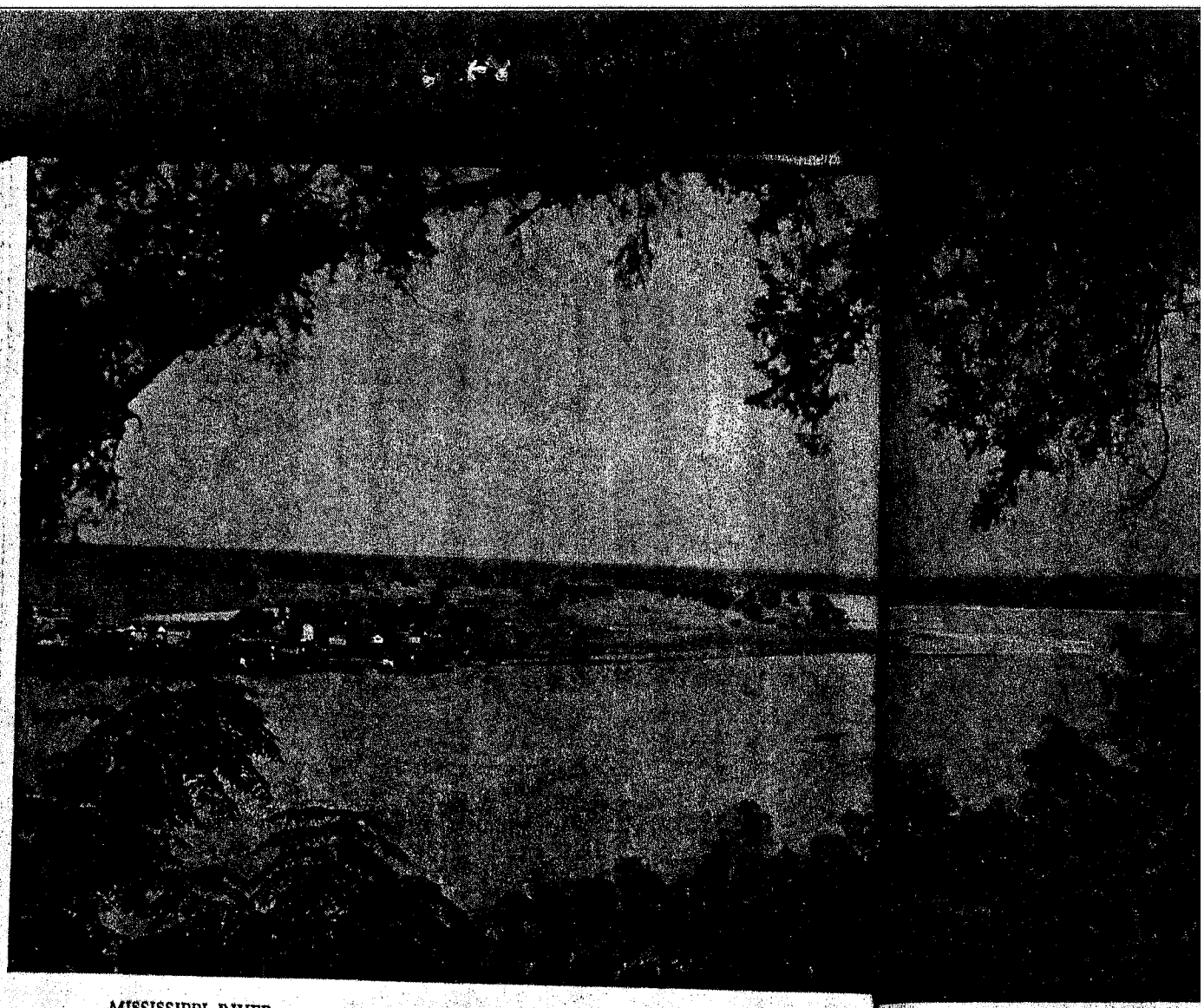
Mississippi Past and Present

What Is Mississippi?

WERE a person to ask, "What is Mississippi?" he undoubtedly would be told, "It is a farming State where nearly everyone who may vote votes the Democratic ticket," or "It is a place where half the population is Negro and the remainder is Anglo-Saxon," or, more vaguely, "That is where everybody grows cotton on land which only a few of them own." And these answers, in themselves, would be correct, though their connotations would be wrong. For while the white people of Mississippi are mostly Democrats, Anglo-Saxons, and farmers, they are not one big family of Democratic and Anglo-Saxon farmers. Rather, Mississippi is a large community of people whose culture is made different by the very land that affords them a common bond. The people of the Black Prairie Belt, for instance, are as different culturally from the people of the Piney Woods as are the Deltans from the people of the Tennessee River Hills. Yet for the most part they all farm for a living, vote the Democratic ticket, and trace their ancestry back to the British Isles.

For this reason, to see Mississippi as it really is, one must understand it as composed of eight distinct geographical units, each with its own sectional background, and each but a part of the whole. To do this gives a perspective which resolves the seeming paradox presented by the writings of Mississippi's two best known interpreters, Stark Young and William Faulkner. Each author simply pictures the section that has conditioned him, and nothing more.

The most clearly defined of the eight sections are the Delta and the Coast. David Cohn has said that the Delta "begins in the lobby of the Peabody Hotel at Memphis and ends on Catfish Row in Vicksburg," and this is possibly more exact than to say that it is a leaf-shaped plain lying in the northwestern part of the State, with its greatest length 200 miles and its greatest width 85 miles. For the native Mississippian long has accepted as fact that the Delta is more than a distinct geographical unit—it is also a way of life. The word "Delta" connotes for him persons charmingly lacking in provincialism, rather than wide flat fields



MISSISSIPPI RIVER

steaming with fertility and squat plantation towns that are all alike. Settled on land as unstable as it is productive, and eternally concerned with two variables and one constant, the planter here has evolved an active yet irresponsible way of life. The variable factors are high water and the price of cotton; the constant is the Negro. In character with all people who are possessed of broad acres and easy labor, the Delta is politically conservative and economically diverse.

Antithetic to the Delta's hectic activity and periodic tension is the lazy halcyon atmosphere of the Coast. Here, where the soil is too sandy to lend itself to intensive agriculture, worry and tautness are vanquished

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brown hills that stretch so
Woodville are, next to the
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AREA CHARACTERISTICS

Geography

Delta Council serves the 18 counties of Northwestern Mississippi. This territory extends along the Mississippi River from the Mississippi-Tennessee line southward to Vicksburg. Of the 18 counties served, ten are situated in the alluvial valley of the Yazoo River and eight are partly in the valley and partly in the hills.

The ten Delta or valley counties and their population are:

Bolivar	(54,299)	Quitman	(20,831)
Coahoma	(46,073)	Sharkey	(10,592)
Humphreys	(19,073)	Sunflower	(45,681)
Issaquena	(3,551)	Tunica	(16,765)
Leflore	(46,904)	Washington	(78,098)

The eight partly hill counties and their population are:

Carroll	(11,150)	Tallahatchie	(24,106)
DeSoto	(23,833)	Warren	(41,937)
Holmes	(26,133)	Tate	(18,083)
Panola	(28,583)	Yazoo	(31,604)

Within this 18-county area are 76 cities, towns and villages ranging in population from 41,502 to less than 500. The total population of the area is approximately 600,000, or more than one-fourth of the people of the State.

Northwestern Mississippi is a relatively flat plain descending from an elevation of 294 feet above sea level at its northern portion, adjacent to Memphis, to 94 feet at Vicksburg. The plain has a slight slope toward the east until it reaches the bluff hills where there is a rise of approximately 100 feet into rolling hills and valleys.

Area communities are located less than 500 miles from St. Louis,

Atlanta, Memphis, Birmingham, Dallas, New Orleans, Houston, Oklahoma City and fourteen other metropolitan areas.

The land area, which consists of approximately 6,000,000 acres, or 23 percent of the State of Mississippi, is composed of 5,275,000 acres of farm and timber land. Most of this farm land is made up of soils formed from sediments deposited by the Mississippi River and its tributaries over a geological span of many years, and is among the richest and most productive in the nation. Because of the relatively flat topography and fertile soil, mechanized farm units are taking the place of small farms. Principal crops are cotton, corn, soybeans, timber and small grains, with cattle and poultry production increasing rapidly in importance.

Climate

The climate of Northwestern Mississippi offers lower costs for industry and low-cost recreation for workers. There are "open-weather" conditions, even in midwinter, and no prolonged periods of windy weather. Most windy spells are caused by low-pressure storm centers, and although there are a few in this area, most low-pressure disturbances follow a path to the north.

Normally there are 200 frost-free days; this is twice as many as in some of the more northern parts of the country. Some families raise two gardens; one starts in the early spring and continues into midsummer, and the other starts in the summer and goes into the late fall. Home vegetable gardens are traditional in the State. Virtually every town has strongly organized garden clubs.

The same sunshine that gives such fine weather for outside activities, even in the winter, is also effective in saving industry and householders money on heating bills. In the coldest month of the winter, January, the temperature averages 45 degrees. This means that it takes only 25 degrees of heat to maintain house and factory temperatures at 70 degrees. This compares with a 50-degree

increase required to maintain the same level of comfort in the northern section of the country.

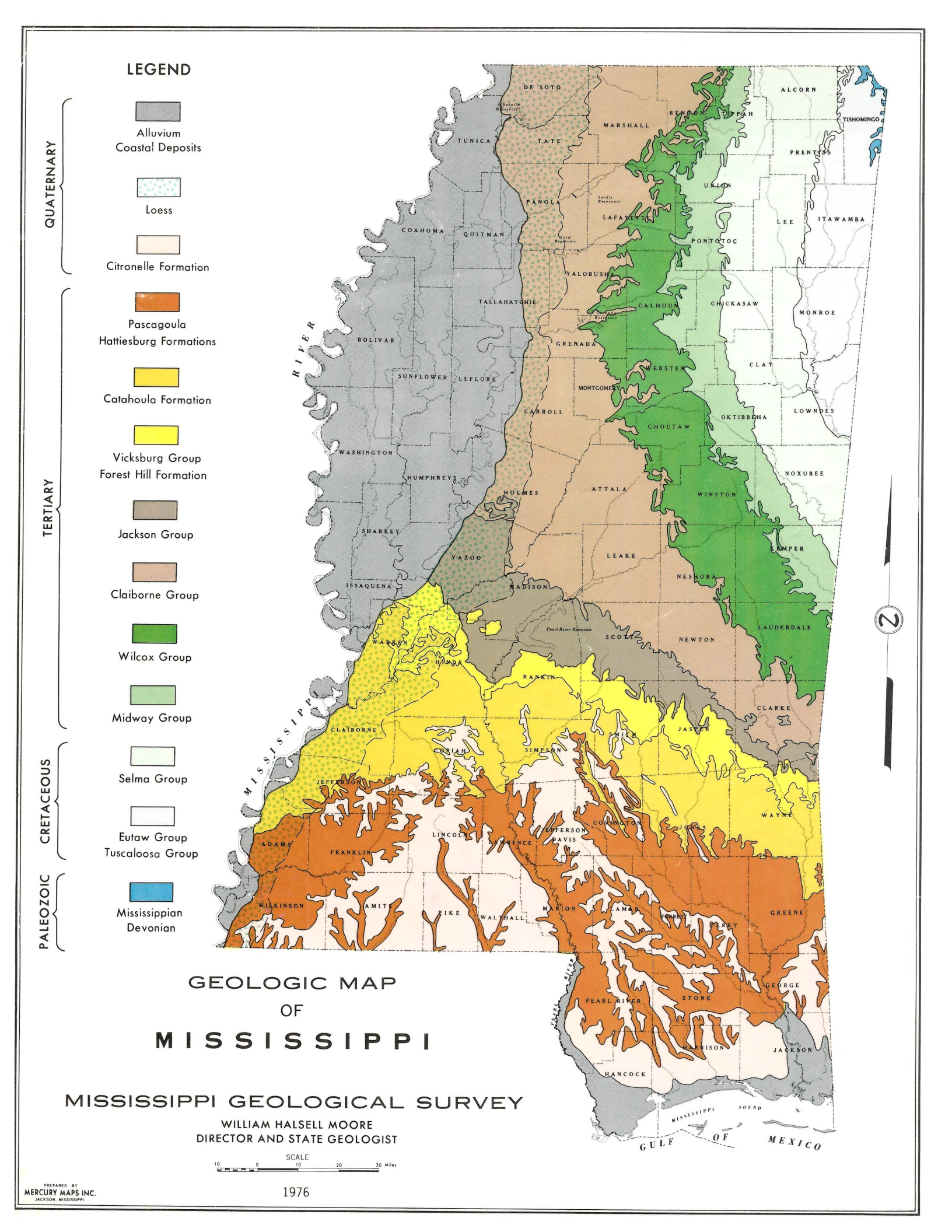
During July, the hottest summer month, the temperature averages 82 degrees. This means that the air must be cooled 12 degrees to maintain a comfort level of 70 degrees. There are very few localities anywhere in the country that do not use some type of air conditioning at some time during the summer months, and it can be seen that air conditioning of 12 degrees in July and heating of 25 degrees in January would cost less in Northwestern Mississippi than the cost of heating alone in many other sections. Most of the air-conditioned factories in the area are those that require certain types of humidity control or which desire the added cleanliness; however, there appears to be a trend in this direction.

In an average year there are more than 140 clear days. This exceeds the Northeast, the Northwest, the Great Lake States and the southeastern part of the country, as well as most of the area along the Gulf Coast. These clear days not only help save on heating bills but they cut down on the use of electricity for lighting.

Another advantage climate makes available to industry is the saving on snow removal. Snow is a rarity in this area. This cuts down on transportation delays and reduces the risk involved in traveling over slick surfaces. Likewise, less frost penetration and ground freeze represents another saving, both in construction costs and normal property upkeep.

Forest Resources

Northwestern Mississippi occupies a central position in a major forest region and offers easy assembling of timber and wood products via water, truck, and rail. The Mississippi Delta's more than 2,000,000 acres of forest lands are covered, for the most part, by hardwoods, cypress being the only softwood



GEOLOGIC MAP OF MISSISSIPPI

MISSISSIPPI GEOLOGICAL SURVEY

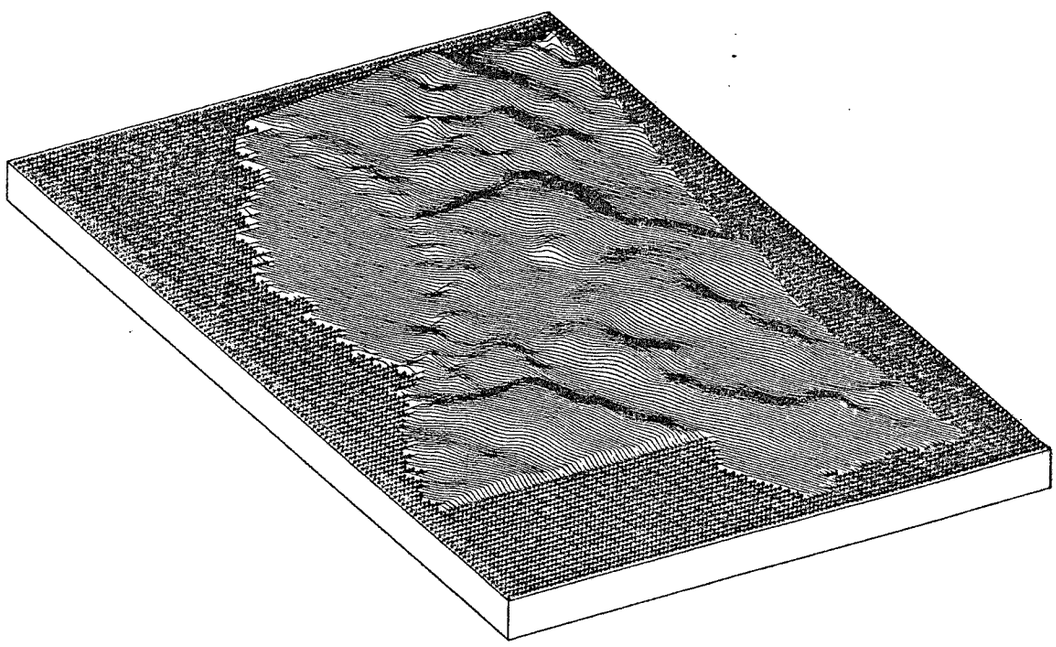
WILLIAM HALSELL MOORE
DIRECTOR AND STATE GEOLOGIST

SCALE

10 0 10 20 30 Miles

1976

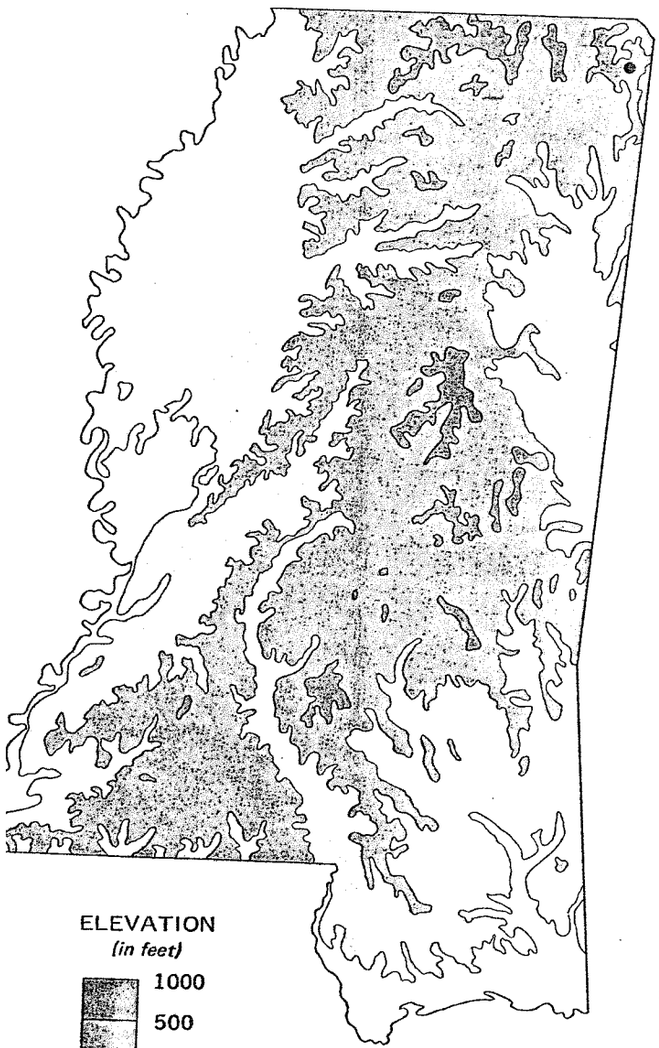
PREPARED BY
MERCURY MAPS INC.
JACKSON, MISSISSIPPI



ELEVATION MAP OF MISSISSIPPI

NOTE: The three dimensional block diagram, located opposite the introduction to each major section in the atlas, represents a recently developed computer method for displaying spatially continuous data. An overview of total quantitative data is represented by "hills" and "valleys," which are proportional to data variation. Hence, spatial relationships among data are dramatically emphasized.

The data maps were produced by a computer driven pen plotter, using a modified version of SYMVU, a program originally developed by the Laboratory for Computer Graphics and Spatial Analysis, Harvard University, Cambridge, Massachusetts.



GENERAL ELEVATION

Source: U. S. Geological Survey

Black Prairie is the Flatwoods, a region of narrow breadth composed of level land. The width of the belt varies from six to twelve miles and extends from Kemper County to the Tennessee line. The region is formed from the Porter's Creek clay, accounting for the heavy clay texture of the soil and the resultant poor drainage.

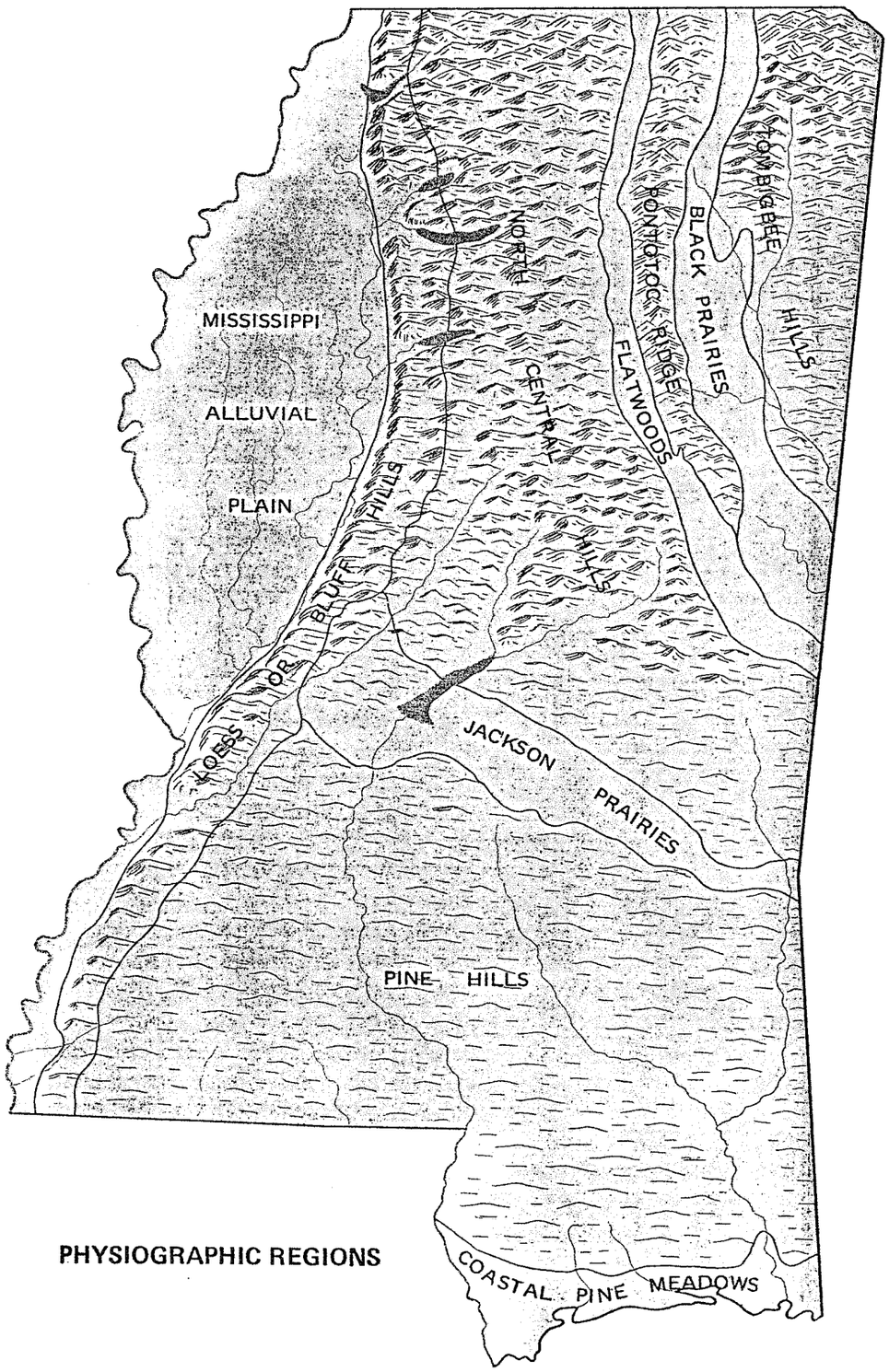
NORTH CENTRAL HILLS

The North Central Hills physiographic region spans an area from Clarke County northwestward through Leake County, and north to the Tennessee line. The region is bordered on the east by the Flatwoods. The area is the most extensive upland in Mississippi, situated from 400 feet to 600 feet above sea level. Because of its elevation and because it is bounded by relatively flat areas on three sides, this region at one time was known as the North Central Plateau of Mississippi. The area is a part of the Red Hills section which extends eastward across southcentral Alabama. Along the south side of the North Central Hills in Lauderdale, Kemper, and Neshoba counties stands a ridge of the most rugged hills found in the coastal plain. This ridge is formed by the very resistant Tallahatta formation and is called the Buhrstone Cuesta. The local name of buhrstone (burrstone) derives from the presence in the formation of silliceous rocks suitable for use as millstones.

BROWN LOAM AND LOESS HILLS

West of the North Central Hills and stretching from the Tennessee line to Louisiana, is the Brown Loam and Loess Hills region. The western boundary is sharply defined as the loess hills drop off to the floodplain of the Yazoo and Mississippi rivers. The area receives its name from the color and character of the surface materials. The hills along the east side of the Mississippi River floodplain are covered with a thick layer of loess. Loess is a buff-colored material, exhibiting an angular structure, and it has a tendency to stand resistant to lateral erosion in vertical columns. The loess is material believed to have been transported by wind from glacial outwash material of Pleistocene age. The loess surface mantle thins eastward over a distance of twenty to forty miles until it blends into the central uplands.

Loess is calcareous and fertile but easily eroded in a direction perpendicular to the surface. The stream



PHYSIOGRAPHIC REGIONS

banks are vertical, and road cuts must be made vertically or erosion is a serious problem. The loess deposits vary from 30 feet to as much as 90 feet in depth in places. Erosion cutting downward has produced an extremely rolling to very hilly landscape.

YAZOO BASIN

In the northwestern part of the state, between the Loess Hills and the Mississippi River and the Walnut Hills at Vicksburg and the Chickasaw Bluffs around Memphis, Tennessee, lies the Yazoo Basin. Locally the Yazoo Basin area is called the Delta, and is almost totally contained between the Mississippi and Yazoo rivers. The region is a floodplain composed of alluvial deposits. The surface of the area appears almost perfectly flat, but close examination reveals slight elevations along the stream banks or along old meander belts of abandoned stream courses. As the streams overflowed, the coarse materials were deposited first along the banks—resulting in a slight building of land higher near the streams than in the surrounding area beyond the stream courses. These uplifted segments of land are known as natural levees. From the natural levees the land tends to slope gently downward into poorly drained topographic depressions known as backswamps. Streams in this region have a very small gradient of less than six inches per mile. They frequently overflow their banks, leaving a thin layer of silt on the natural levees and increasing poor drainage conditions in the backswamp areas. Streams here also tend to shift their courses frequently, often leaving behind a partially water-filled meander loop called an oxbow lake. As a flood control measure artificial levees have been constructed on top of the natural levees. This procedure has resulted in increased deposition of silt on river beds and raised the water level. Reservoirs to regulate stream flow have also been built in the interest of flood control.

JACKSON PRAIRIE

The Jackson Prairie section lies in a narrow belt reaching from Clarke to Madison counties. The region is a flat to undulating area underlain by limestone, marl, and clays of the Vicksburg and Jackson formations. The original vegetation cover consisted of open patches of grasslands, interspersed with woodland areas. The underlying parent materials have resulted in the formation of two distinct major surface regions. The dark, calcareous surficial area, the product of weathering of limestones and marls, is similar in color and consistency to the surface materials of the Northeast Prairie. The second section is lighter in tone and is a product of weathered clay.

In the Jackson Prairie are not only relatively good agricultural soils, but also sufficient quantities of limestone and clay to support a cement industry. Portland cement plants are located nearby at Vicksburg and Brandon.

PINE WOODS

Extending southward from Jackson Prairie to within twenty miles of the Gulf Coast, and from the Alabama state line to the Brown Loam Belt is the Pine Woods region. The general surface configuration is high and rolling, with moderately high ridges forming divides between streams. Elevations in excess of one hundred feet between the hill tops and stream bottoms are not uncommon. Most of the area is between 300 feet and 500 feet above sea level. The region was at one time covered with a magnificent stand of longleaf pines and was referred to as the Longleaf Pine Belt. The subsurface materials are composed of the Catahoula Sandstone, the Hattiesburg, and the Pascagoula sands and clays; for about eighty miles inland, the hill summits and higher levels are topped with Citronelle deposits. The streams of the area trend southward for the most part, and the region is bisected by the Pearl River near its east–west midpoint. The eastern section is drained largely by tributaries of the Pascagoula River, whereas the western section is drained by a number of streams.

COASTAL MEADOWS

The Coastal Meadows area marks the present shoreline where the Gulf waters meet the land, and extends inland some fifteen to twenty miles. A well defined seaward boundary is not apparent. It is more appropriate to consider this section as being the outer edge of the East Gulf Coastal Plain Province, and as an area continually changing in its character and position. The region's surface is relatively flat with a very slight upslope toward the interior. The surficial materials are largely composed of recently deposited fine sands and silts.

Arthell Kelley

GEOLOGY

Physiographically, Mississippi lies in the East Gulf Coastal Plain Province except for small areas in Tishomingo County which are part of the Interior Low Plateaus region, a subdivision of the Interior Lowlands Province. The Gulf Coastal Plain is formed by gently tilted Mesozoic and Cenozoic deposits which rest on deformed rocks of the Appalachian and Ouachita mountains. These deposits consist of sediments laid down in marine, brackish, and fluvial environments and are tilted toward the Mississippi Embayment in the northern part of the state. The amount of tilting varies between 15 and 35 feet per mile at the surface and increases with depth. The oldest rocks in Mississippi are in the northeastern corner and become progressively younger toward the coast—a result of land building out into the ancestral Gulf of Mexico.

INTERIOR LOW PLATEAUS

The only portion of Mississippi in the Interior Lowlands Province is found along its eastern margin in Tishomingo County where older Paleozoic rocks are exposed at the surface. This area is closely related to the plateau regions of Tennessee and Alabama, and is probably the southernmost extension of the Nashville Dome. The rocks are Devonian and Mississippian in age and consist of limestone, shales, sandstones, and chert.

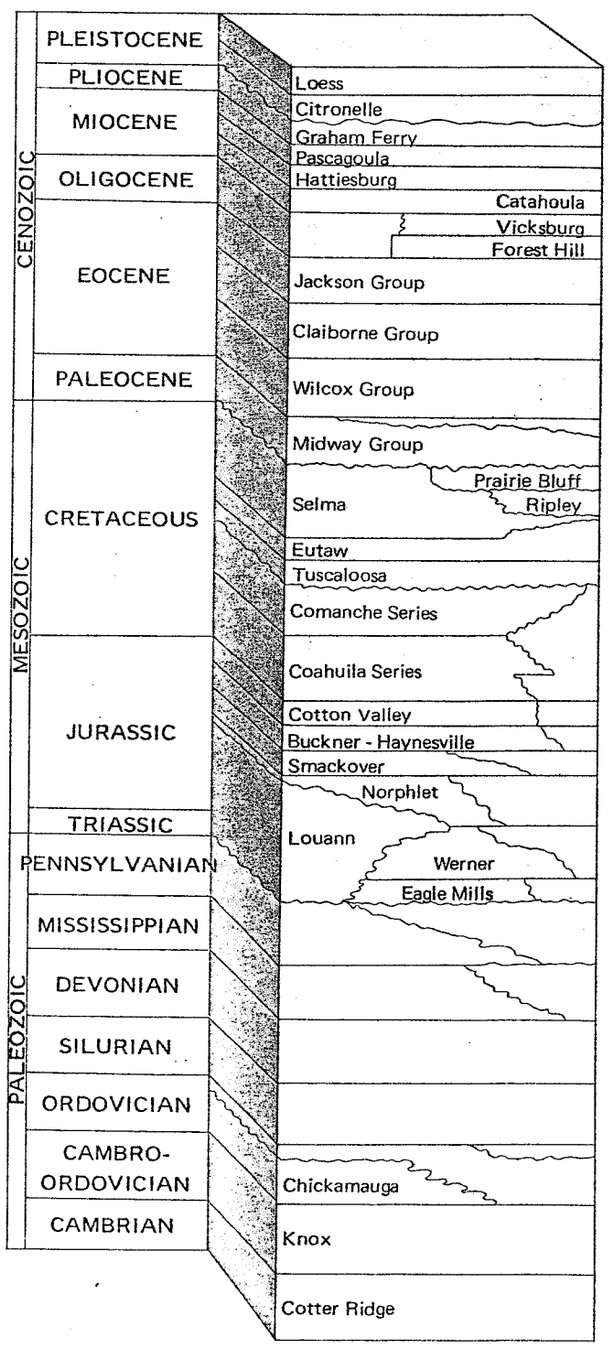
GULF COASTAL PLAIN

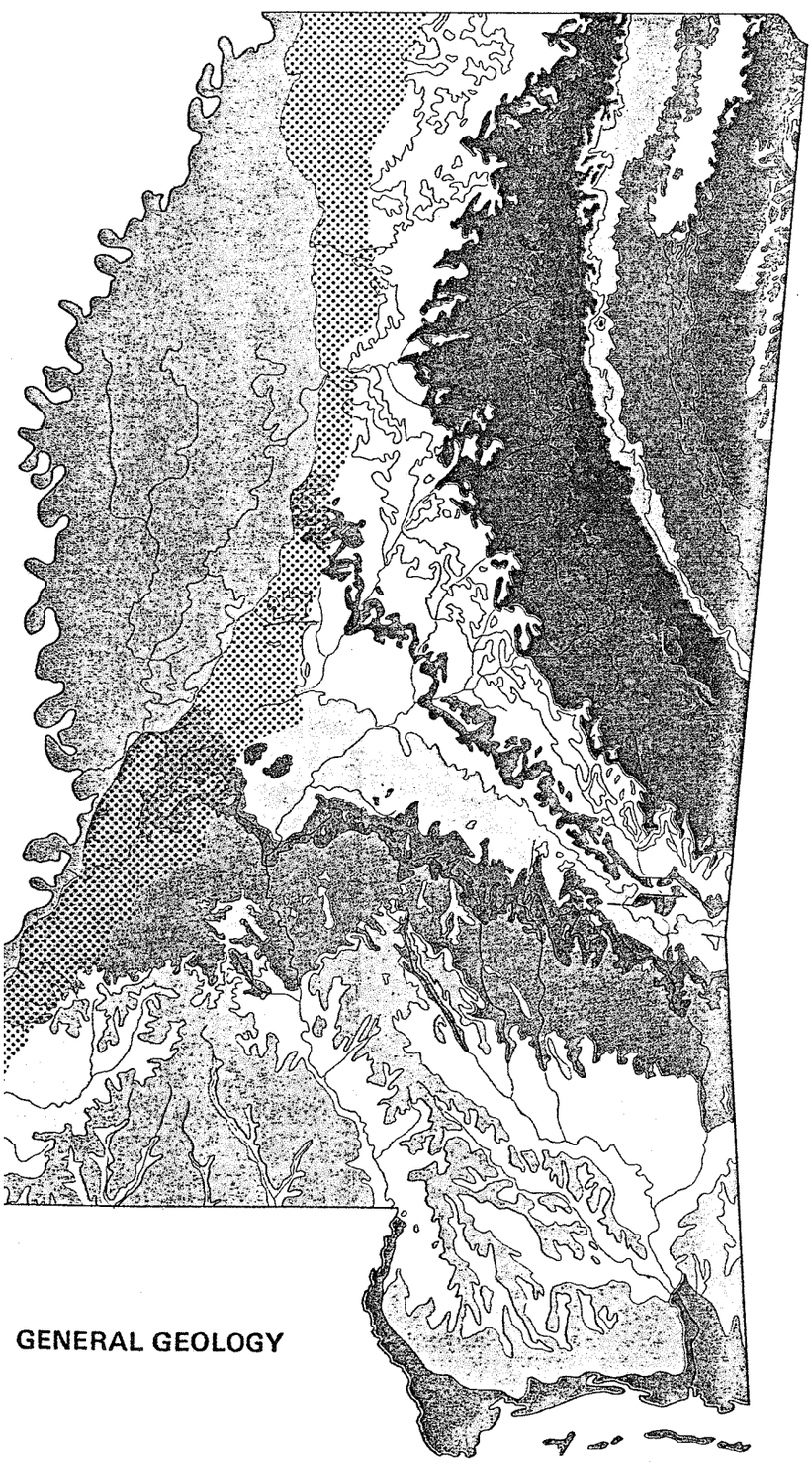
The Mesozoic and Cenozoic surface deposits consist of sediments ranging in age from upper Cretaceous (Gulf Series) to Recent. Rocks representative of the intervals of time from Mississippian to Gulfian, i.e., Pennsylvanian, Permian, Triassic, Jurrassic, Coahuilan (Cretaceous), and Comanchean (Cretaceous) are not present on the surface in Mississippi, but all, except the Permian, have been encountered in drilling for oil and gas.

MESOZOIC ERA

The Cretaceous Period marks the end of the interval of time referred to as the Age of Dinosaurs. Since most of the Cretaceous deposits of Mississippi were laid down under marine conditions, the only dinosaur remains are those of the few marine reptiles living during the time. The oldest Cretaceous deposits at the surface consist of stream sands and gravels, which are overlain by chalk and marls composed primarily

GEOLOGIC COLUMN



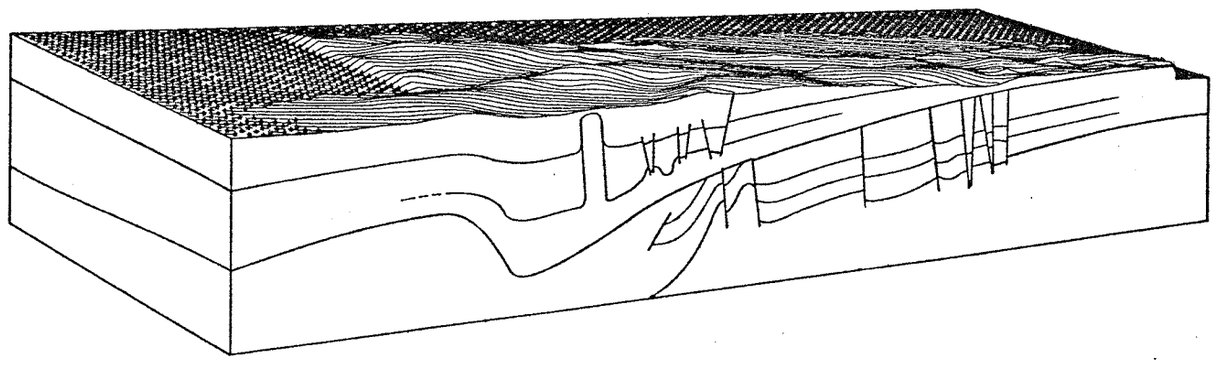


GENERAL GEOLOGY

LEGEND

- Alluvium
- Coastal deposits
- Loess and brown loam
- Citronelle formation
- Pascagoula and Hattiesburg formation
- Catahoula formation
- Vicksburg group and Chickasawhay limestone
- Forest Hill formation and Red Bluff clay
- Jackson group
- Cockfield
- Cook Mountain formation
- Kosciusko formation
- Zilpha formation and Winona formation
- Tallahatta formation and Neshoba sand
- Wilcox formation
- Naheola formation
- Porters Creek formation
- Clayton formation
- Prairie Bluff chalk and Owl Creek formation
- Ripley formation
- Demopolis chalk
- Mooreville chalk
- Coffee sand
- Eutaw formation
- Tuscaloosa formation
- Chester group
- Limestones, chert and shale

Source: U.S. Geologic Survey



GEOLOGIC CROSS SECTION

Source: Mississippi Geological Survey

of shells of microscopic marine organisms. The chalk and marls support an abundant growth of red cedar. Bentonite clays within these sediments are formed by the alteration of volcanic ash which fell in the northeastern part of the state. Other products of igneous activity include buried intrusions at Jackson and Midnight in Humphreys County which were formed during the same time period as the Bentonite clays.

CENOZOIC ERA

This era marks the advent of forms of life similar to that of today and is often referred to as the Age of Mammals. The Cenozoic deposits of Mississippi cover approximately 85 percent of the state or that portion lying south and west of a line from New Albany to Houston to Starkville to Shuqualak. This era of time is divided from oldest to youngest into the following epochs: Paleocene, Eocene, Oligocene, Miocene, Pliocene, Pleistocene, and Recent.

The Midway Group of the Paleocene Series consists of a basal limestone unit, a middle clay unit, and upper sand and lignitic clay.

The "gas rock" which formerly produced gas in the Jackson field was deposited during the Paleocene Epoch.

The Eocene Series of Mississippi is divided into the Wilcox, Claiborne, and Jackson groups. The Wilcox Group, the oldest of the three, consists of sands, clays, and lignites deposited in brackish marshes and stream valleys. The lignites are intermediate between peat and coal and have heating values ranging from 8,000 to 10,000 BTU. Numerous sharks' teeth have been found in a few thin marine marls in the east-central part of the state. The Wilcox Group is exposed along a ten- to twenty-mile belt extending from Meridian to Louisville and Eupora, stretching into Benton County at the northern end of the state.

The Claiborne Group resembles the Wilcox in the content of brackish clays and fluvial sands, but differs in having a greater percentage of marine greensands and marls. The marls contain numerous mollusc shells such as those found around Newton. The basal unit of this group is a siliceous siltstone sometimes referred to as buhrstone because it was once used to make grinding wheels for pulverizing grain.

The Jackson Group is best known for its fossil whale bones and large shark teeth as well as for its ability to absorb water and expand. This capability for expansion produces many problems in the construction business, since the force exerted is sufficient to crack foundations and highway surfaces. The Jackson Group is exposed along a belt extending from

Yazoo City to Shubuta with its greatest width lying between Jackson and Canton.

The Oligocene Epoch is represented principally by the Vicksburg Group and also by lignitic sands and clays of the Forest Hill. The latter is interpreted as indicative of deposition under brackish water or deltaic conditions. The Vicksburg Group, overlying the Forest Hill, is marine as indicated by the abundance of marine fossils such as the scallop *Pecten*, the shell which serves as the symbol for the Shell Oil Company. The Vicksburg Group is little more than 100 feet thick and is exposed along a belt only one or two miles wide from Vicksburg to Waynesboro.

The Miocene Series of rocks consists primarily of sediments deposited in fresh water, demonstrated by the presence of fresh water and land plant fossils. This series is difficult to subdivide into formations because of the similarity of rock types, but three units have historically been assigned. These are, from older to younger and north to south, the Catahoula Sandstone, Hattiesburg Formation, and Pascagoula Formation, all of which consist of alternating sands and clays extending to within a few miles of the coast.

The lower part of the Graham Ferry Formation is the only unit that is presently recognized as being Pliocene in age. The Graham Ferry Formation consists of both brackish and marine sands and clays, with mollusc shells being the basis for assigning the lower part of this unit to the Pliocene and the upper part to the Pleistocene.

The Pleistocene sediments of Mississippi were laid down during the Ice Age when glaciers covered North America as far south as southern Illinois. These sediments consist of stream-laid sands and gravels called Citronelle and a windblown silt called loess. The Citronelle Formation overlies formations of a number of epochs of geologic time due to its widespread distribution in the southern part of the state. It also underlies the loess along a narrow belt paralleling the aforementioned bluffs from Louisiana to the Tennessee state line. The loess is a windblown, calcareous silt deposited during the latter part of the Pleistocene Epoch on the eastern side of the Mississippi River floodplain (the Delta area). The loess is approximately 75 feet thick near the bluffs at Vicksburg and Natchez, but thins rapidly to the east. These deposits contain remains of mastodons, tapirs, buffalo, and other Ice Age mammals.

The youngest sedimentary materials in Mississippi are the alluvial deposits of the stream valleys and the shoreline deposits of the coast. The most extensive area of alluvial deposits is found west of the loess bluffs in the Delta, a plain formed by flooding and course changes of the Mississippi River. Ancestral courses of the Mississippi include parts of the present beds of the Sunflower and Yazoo rivers in which the Mississippi River flowed some 4,000 to 5,000 years ago.

Thus far only the near surface sedimentary rocks which are gently tilted toward the Gulf of Mexico have been discussed. In the subsurface, however, the rocks are more strongly tilted, fractured and deformed to produce subsurface basins and ridges. The largest of these features are the Black Warrior basin and the Mississippi salt basin which are separated by the central Mississippi ridge. Recent investigations indicate that the central Mississippi is a deformed area produced when the Ouachita Mountains were sheared from the Appalachian chain. South of the ridge is a fracture zone called the Pickens–Gilbertown fault zone. South of the fault zone is the Mississippi salt basin area, underlain by a thick layer of salt which has flowed upward in many places to form salt domes.

In the southern part of the state are two uplifted areas called the Adams County High and Wiggins Uplift. Oil and gas fields associated with these features are shown in the section on mineral resources. Two small but interesting areas in central Mississippi are designated Midnight Volcano and Jackson Dome. These two features were produced by molten or igneous material pushing its way toward the surface, losing energy, and being subsequently covered by younger sediments.

The preceding summary is an extremely condensed version of the 350 million years represented by the geology of Mississippi. Many details have been eliminated by necessity, but the general reconstruction represents at least a general overview of the geologic formation of the state. Perhaps this overview will create a better understanding of the processes involved in the creation of Mississippi's land configuration and an appreciation for the countless hours contributed by geologists in unraveling the story in the rocks.

Oscar L. Paulson Jr.

CLIMATE

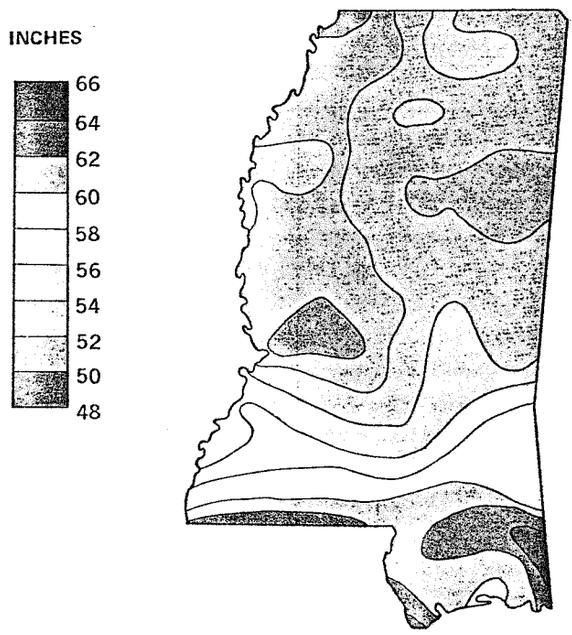
Mississippi has a humid subtropical climate, though microclimatic factors vary from place to place within the state. Mississippi lies outside the principal storm tracts that cross the country; its climatic variations are broadly determined by the large land mass to the north and west and by the Gulf of Mexico to the south. These surface areas produce alternate flows of cold air moving southward and warm, moist air moving northward. Transitions, or fronts, between these flows frequently bring abrupt changes in weather conditions. The climates of Mississippi are the result of such interactions and modifications between the air flows and of the temporal patterns of the weather changes they produce.

MOISTURE

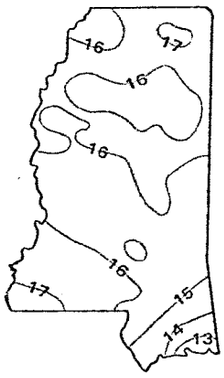
PRECIPITATION—The southern one-third of Mississippi lies within an area characterized by maximum precipitation east of the Rocky Mountains. The mean annual precipitation exceeds 55 inches in the southern one-third of the state and ranges from 60 to 65 inches on and near the coastal region. Elsewhere annual means are 51 or more inches during the year, with the exception of a few scattered locations in central and northern Mississippi where annual precipitation is less than 50 inches. In most years annual precipitation is within 15 inches of the mean. The annual totals of precipitation in Mississippi between 1888 and 1972 have varied from a high of 102.89 inches at Beaumont in 1961 to a low of 25.97 inches at Yazoo City in 1936. In the coastal region, the greatest mean precipitation occurs in summer; in the southeast and southcentral parts of the state, more precipitation falls in spring. Elsewhere rainfall is highest in winter. The season with the lowest mean precipitation is summer in the upper Delta and fall in all other segments of the state. Seasonal precipitation has varied from a high of 36.28 inches in the upper Delta during the winter of 1931–32 to a low of 2.46 inches in the northeastern portion of the state during the fall of 1972, inclusive of the period 1931–1972. Monthly totals at individual stations have varied from 30.75 inches (July, 1916, at Merrill) to zero (reported by various stations ranging from April through November during the period 1888–1972).

EVAPORATION—Evaporation is controlled by heat fluxes at the earth's surface. Some precipitation is returned as water vapor to the atmosphere. Part of the soil moisture is likewise evaporated; some is used in life processes of vegetation and is transpired as water vapor to the atmosphere. The annual mean loss of evapotranspiration is about 54 inches in extreme northeastern Mississippi, and ranges up to about 65 inches in parts of the most southerly Gulf Coast. The rate of evaporation has an important impact on water storage in ponds and reservoirs, and on agricultural crops both irrigated and nonirrigated. The mean evaporation for May through October for northeastern Mississippi is about 39 inches (73 percent of annual) and about 43 inches for the southern Gulf Coast (66 percent of annual). Pan evaporation (estimated evaporation from a NWS class A pan) represents maximum or potential evaporation. Shallow lake evaporation is about 74 percent of pan. The actual soil water loss is usually less since soil moisture is limited.

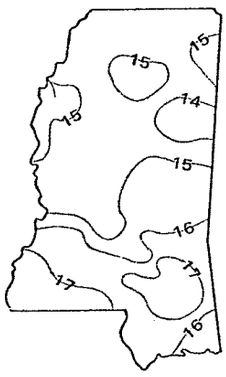
DROUGHT—Mississippi is vulnerable to short-duration droughts. Normally, the state has abundant rainfall which supplies sufficient soil moisture for crops. Drought is interpreted as a rainfall below normal for several weeks, and is soon detected in deficiencies of soil moisture and other water resources. Mississippi droughts generally occur within the an-



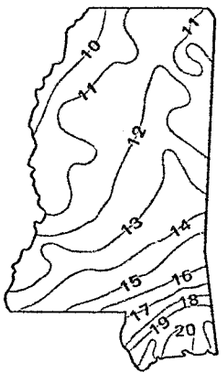
AVERAGE ANNUAL PRECIPITATION



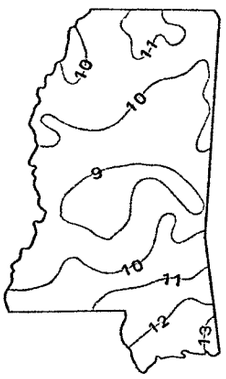
WINTER PRECIPITATION
December - February
(inches)



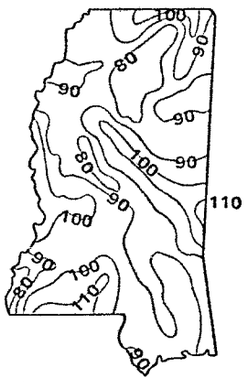
SPRING PRECIPITATION
March - May
(inches)



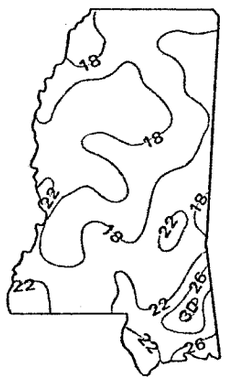
SUMMER PRECIPITATION
June - August
(inches)



FALL PRECIPITATION
September - November
(inches)



AVERAGE ANNUAL PRECIPITATION DAYS



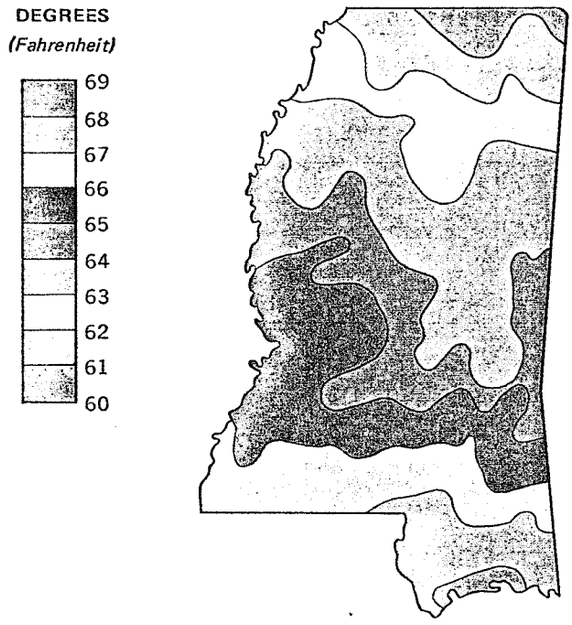
GREATEST MONTHLY PRECIPITATION
(inches)

Source: National Weather Service, 1891 - 1960

nual growing season. Droughts make irrigation in Mississippi economically feasible at some locations; damaging dry spells often occur during periods when certain crops have critical water requirements for growth. Occasionally during the warmer season, pressure distribution is altered, bringing westerly or northerly winds. If these conditions are prolonged, drought conditions affecting agriculture may develop, and forest fire potential increases. Prolonged droughts are rare in humid Mississippi, but normal ground or surface-water supplies are reduced. However, even during drought periods widely scattered thundershowers usually occur.

THUNDERSTORMS—Thunderstorms occur from 50 to 60 days per year in the northern portions of the state; from 70 to 80 days per year near the Gulf Coast. During the warmer months, the coastal region experiences about 90 percent of these storms between 6 a.m. and 6 p.m. Further inland, 85 percent occur between noon and midnight. The number of thunderstorm days decreases to a minimum in the late fall and early winter as the slow-moving, rain-suppressing high pressure areas increase in frequency. Thunderstorms in the late fall, winter, and early spring are usually associated with passing cyclonic weather systems. These may occur at any hour, and are usually accompanied by higher wind velocities than in summer. In the winter about one-sixth to one-fourth of precipitation days experience lightning and/or thunder. Thunderstorms in Mississippi only occasionally produce hail that reaches the ground. Annually, over half of all hailstorms occur in the spring months; summer thunderstorms seldom produce hail. Most of the hail reported in Mississippi is less than an inch in diameter; hail damage chiefly affects vegetation and is usually confined to small areas of only a few square miles.

SNOW—Measurable snowfalls have occurred in some portions of Mississippi from as early as November to as late as April. The mean annual snowfall is about four inches near the northern border and decreases southward. In the southern third of the state it is usually less than one inch. A record depth of 18 inches on the ground was measured at Mount Pleasant on December 23, 1963. Some years stations may record no snowfall or only trace amounts. A single storm may account for a significant portion of a season's snowfall.

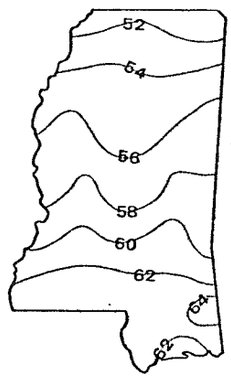


AVERAGE ANNUAL TEMPERATURE

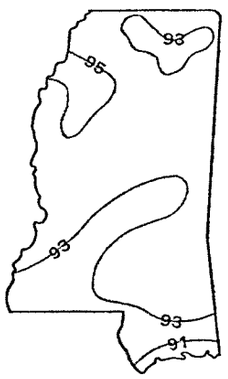
TEMPERATURE

Mississippi's mean annual temperatures vary with latitude. Northern border counties average 61° F. to 62° F. and increase southward to about 68° F. in the Gulf Coast counties.

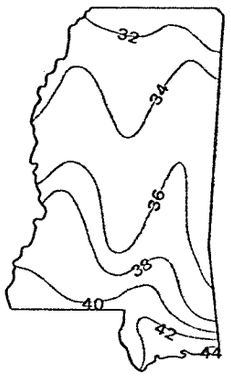
MAXIMUM TEMPERATURES—Summer (June, July, and August) is influenced by the position and strength of the Bermuda High pressure system. Moreover, the jet stream is generally weak and located far to the north in summer and cold frontal passages are rare. The mean summer temperature is about 80° F. or 81° F. Except near the Gulf Coast, daytime maximums exceeding 90° F. sometimes occur every day in July or August. Near the immediate Gulf Coast, stations have reported an annual mean of fewer than 65 days when the temperature reaches 90° F. or higher. Inland, the number of days for 90° F. temperatures increases to more than 90 in most of the northern sections of Pearl River, Stone, and George counties. Further inland the number of days increases, exceeding 104 days in some locations. Northward, the mean number of days with temperatures over 90° F. decreases to as few as 80 to 65 days. With the exception of three years (1946, 1958, and 1961) during the period 1888–1972, temperatures rose to 101° F. or higher at one or more Mississippi locations. All of the



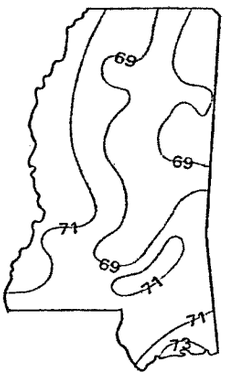
AVERAGE JANUARY MAXIMUM TEMPERATURE
(degrees Fahrenheit)



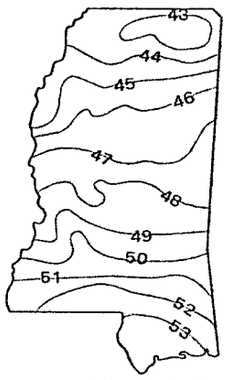
AVERAGE JULY MAXIMUM TEMPERATURE
(degrees Fahrenheit)



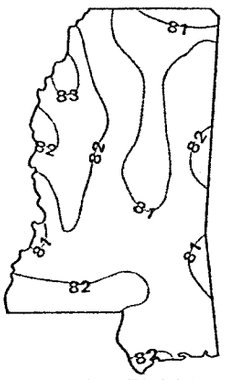
AVERAGE JANUARY MINIMUM TEMPERATURE
(degrees Fahrenheit)



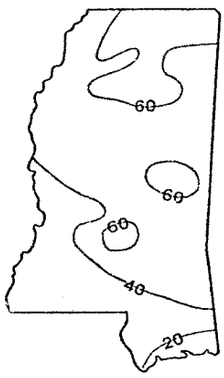
AVERAGE JULY MINIMUM TEMPERATURE
(degrees Fahrenheit)



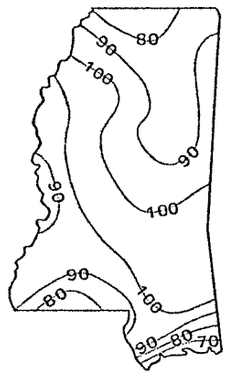
JANUARY AVERAGE TEMPERATURE
(degrees Fahrenheit)



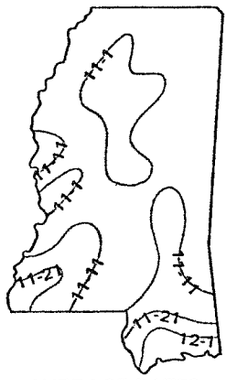
JULY AVERAGE TEMPERATURE
(degrees Fahrenheit)



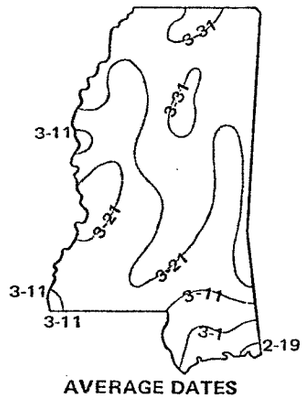
AVERAGE NUMBER OF DAYS UNDER 32°
(Fahrenheit)



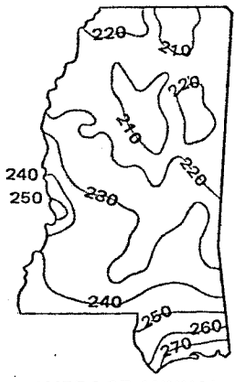
AVERAGE NUMBER OF DAYS OVER 90°
(Fahrenheit)



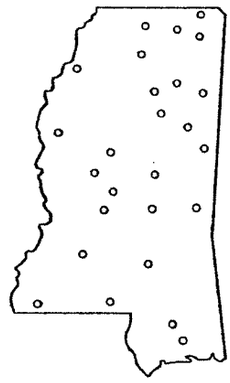
AVERAGE DATES FIRST FROST



AVERAGE DATES LAST FROST



AVERAGE ANNUAL FREEZE-FREE DAYS



RECORDING STATIONS

Source: National Weather Service

official temperature reporting stations in Mississippi have recorded temperatures exceeding 100° F. Holly Springs reported 20 days with temperatures 100° F. or warmer and reached a temperature maximum of 115° F. on July 29, 1930. Temperatures reached 114° F. at Aberdeen on July 13, 1930, including 24 days 100° F. or warmer.

MINIMUM TEMPERATURES—Minimum temperatures occur during the low sun period or winter season. Mean annual minimum temperatures occur most frequently during the month of January in Mississippi, while December and February rank as the second and third coldest months respectively at most stations within the state.

Stations situated in the northern tier of counties tend to record the lowest January monthly minimums. Here the overall average is about 31.2° F., with reports at individual stations ranging from 29.1° F. to 32.6° F. Proceeding southward, January minimums tend to increase so that stations in the middle of the state experience January minimum temperatures ranging from the middle thirties to the high thirties.

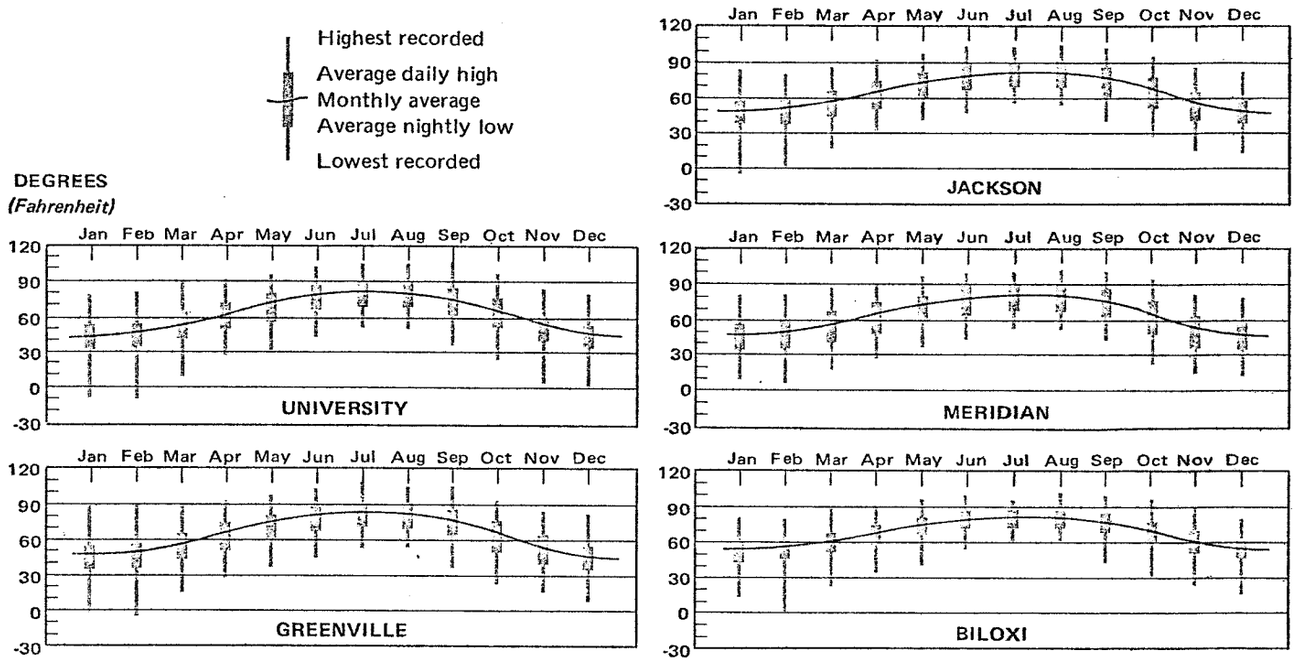
Coastal stations register the highest January minimums. The overall average is approximately 43.2° F. with temperatures occurring at individual stations from 41.2° F. up to 44.2° F.

Absolute minimum temperatures occur most frequently in the month of February in Mississippi. January and December are the only other months in which absolute minimum temperatures have been recorded and rank second and third respectively. The absolute minimum temperature of −16° F. was recorded in February, 1966, at Batesville in Panola County.

SUNSHINE

The mean annual hours of sunshine range from about 2800 in the Upper Delta to about 2600 in other parts of the state. The mean annual percentage of possible sunshine is 60 to 64 percent. On the winter solstice (December 22) the sun is above the horizon for 9 hours and 48 minutes along the extreme northern Mississippi border, and for 10 hours and 13 minutes at the extreme southern tip of the state. After that date, the length of the day increases until the summer solstice (June 21), when the sun is above the horizon for 14 hours and 31 minutes along the state's extreme northern border, and decreases southward to

TEMPERATURE RANGES OF SELECTED CITIES
1951 – 1960



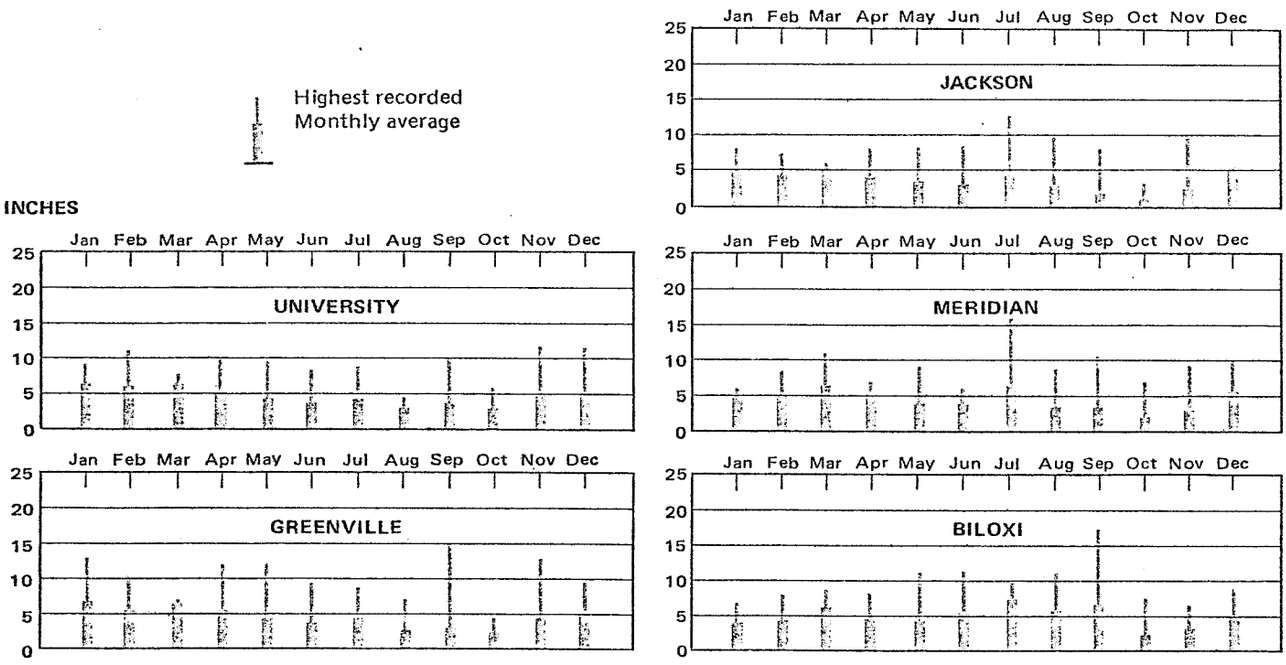
14 hours and 6 minutes at the extreme southern tip. The monthly mean total hours of sunshine reaches a low of 140 hours or less in northern Mississippi in December and January; during these months it is less than 160 hours in the southern part. Maximum period of sunshine occurs in June—time ranges from about 320 hours in the extreme northwest down to about 190 hours in sections of the southeast. In July the number of sunshine hours decreases and ranges from 250 to 260 hours in the southwest and up to 310 to 320 hours in the northwest.

The direct sunshine received is related to cloudiness; annually, cloud cover exists for little more than half of the day. The maximum cloudiness and the minimum sunshine occur in the winter months when rainy and/or overcast days are most frequent. From spring through summer and on to October, the average amount of cloudiness generally decreases in the state except for a July increase along the coast. Usually the least cloudiness occurs in October. The number of clear days is minimum in January and February, generally increasing to a maximum in September and October in most of the state, with the exception of a decrease in June and July near the coast.

HUMIDITY

The annual mean relative humidity is approximately 70 percent near the Tennessee border and increases southward to 76 percent. During a day the relative humidity values vary widely—dropping with rising temperatures and increasing with falling temperatures. Ordinarily the lower relative humidities occur in the warm afternoon hours; later, when temperatures cool, the values increase, reaching high percentages late at night with maximums occurring in the early morning hours. Humidities below 30 percent are most apt to occur in October and November; the number of days with humidities of below 30 percent are fewer in the other months and are at a minimum in the summer. Humidities between 30 and 50 percent occur each month; on an annual basis they total about one-half of the hours in northern Mississippi. Humidities of 90 percent or higher may occur at any hour throughout the year, but are most frequent in the early morning hours and during periods of rain. Heavy fog occurs occasionally near daybreak; it generally dissipates early in the forenoon and rarely lasts through the day. When a combination of high temperature and high dewpoint (high humidity) develops, conditions can

PRECIPITATION RANGES OF SELECTED CITIES
1951 – 1960



Source: National Weather Service

become uncomfortable. In summer, high humidities may build up progressively for several days, and the nights may become oppressive. Such conditions are most noticeable when wind velocity is very light or calm during the late afternoon or night. The principal means of relief is brought by thundershowers, which are sometimes accompanied by locally destructive and violent winds.

WINDS

Winds in Mississippi occur from the southeast to the southwest quadrants for more hours annually than from other sectors of the compass. The average wind speed is 10 mph or less; wind velocities are higher near and during storm periods. On an annual basis calm conditions are present about one-tenth of the time. Windy weather for a prolonged period accompanies intense, slow-moving pressure disturbances coming from the west, while relatively shorter periods of windy weather are associated with passing fronts, squall lines, or thunderstorms.

Damaging winds may occur any hour during the year. High wind speeds are usually associated with severe local storms which begin as thunderstorms. Nearly every squall line of moderate to heavy intensity produces damaging winds, damaging lightning strokes, local pockets of hail, and small areas of heavy rain. These areas of damage lie in swaths that extend in the direction of the storm movement. Most of them show direct evidence of being produced by straight-line winds, some of which may have turbulent downdraft gusts of 100 mph or more at the surface.

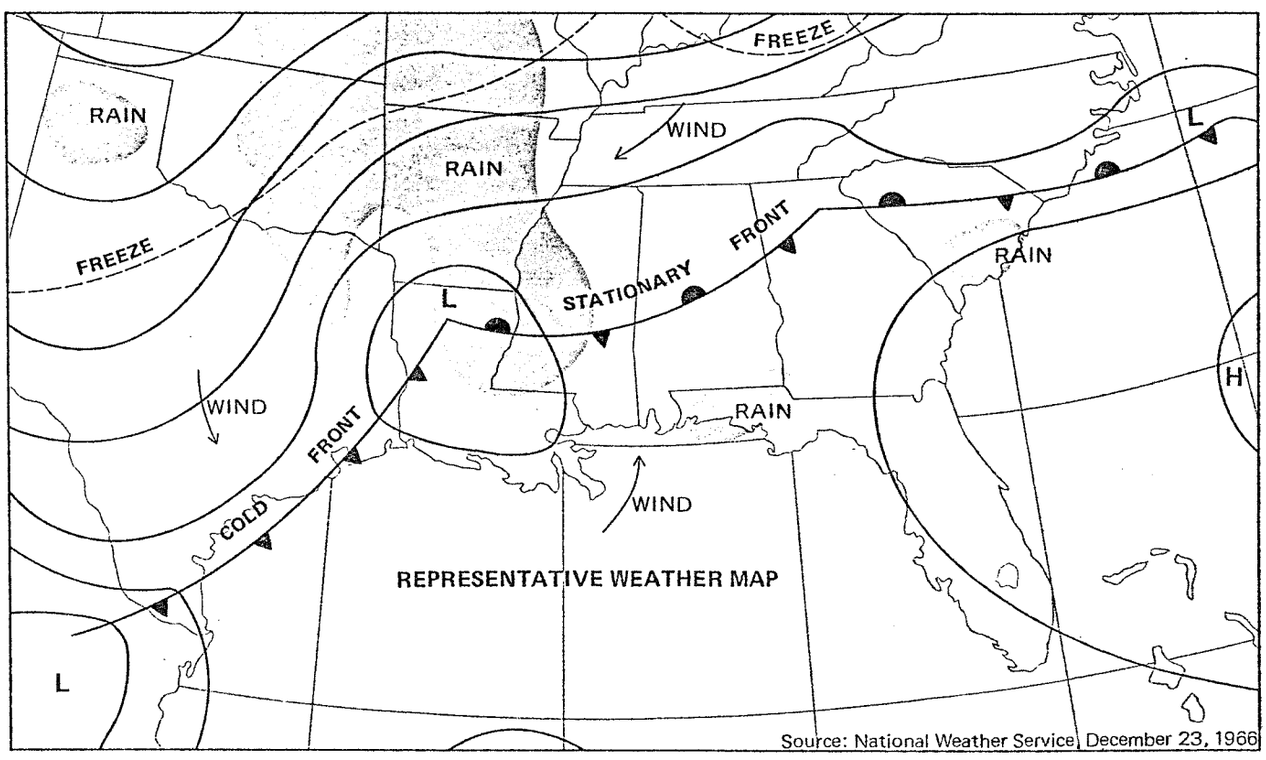
Tornadoes—Rotary winds in Mississippi appear in the immediate vicinity of a tornado funnel and when these winds touch the ground the ensuing damage shows evidence of the rotary origin. These winds whirl at a rate of 200 mph or more around funnels commonly extending several hundred yards in diameter. These small, severe storms first form several thousand feet above the earth's surface, usually during warm, humid weather, and most frequently in conjunction with a severe thunderstorm. When the weather conditions are right, sometimes a family series of two or more are associated with a parent thunderstorm or with a squall line which may extend for a distance up to several hundred miles. As the storm front moves, tornadoes may form at intervals along its path, travel for a few miles, and dissipate. Heavy

hail, downpours of rain, and lightning flashes of high intensity often precede a tornado. Among the random motion of the dark heavy clouds of the parent thunderstorm system, funnel clouds appear below and usually as an extending pendant from the turbulent overcast sky; funnel clouds are wide at the top and taper to a small diameter toward the earth. This funnel is the generally pale, visible condensation around a violently rotating column of air whirling in corkscrew fashion.

Many funnel clouds in Mississippi only exist for a few minutes and never lower to the ground. Others only momentarily touch down, rise, then dissipate and disappear; however, a few stay on the ground for longer periods. The tornado winds have a distinctive roar which can be heard for several miles. The roar of the funnel cloud aloft, a shrill high-pitch shriek, increases as the funnel nears the ground, and is loudest (a deafening roar) when the tornado dips to the ground and churns the earth as it moves across the surface. Spherics measurements show that the tornado is accompanied and preceded by intense electrical activity, resulting in many more lightning discharges than in a typical thunderstorm (more than five times as many).

Tornadoes in Mississippi are embedded in a wide area of straight-line winds which may be moving at a speed up to 45 mph or more. The tornadoes vary considerably both in intensity and area covered. Funnel clouds range in length from 800 feet to 2,000 feet and most last less than eight minutes. Some touch the ground for less than a minute, or the end that touched down causes damage in an area only a few yards across. Other tornadoes last much longer; the destructive tip at the earth's surface may be as large as 300 yards and at times encompass an area slightly over a mile wide. Inside the spinning funnel a partial vacuum is formed. A tornado-enveloped building explodes outward, while a building at the edge of the funnel blows down. This happens in a matter of seconds, and debris is thrown in all directions.

Tornadoes can occur in any county in Mississippi, but years may go by without a funnel cloud touching down anywhere in the state. Tornadoes may occur at any hour, though their greatest frequency is between 1 p.m. and 7 p.m. Most Mississippi tornadoes occur in sparsely settled areas and without deaths or injuries. The relatively few large, long-lasting, more severe tor-

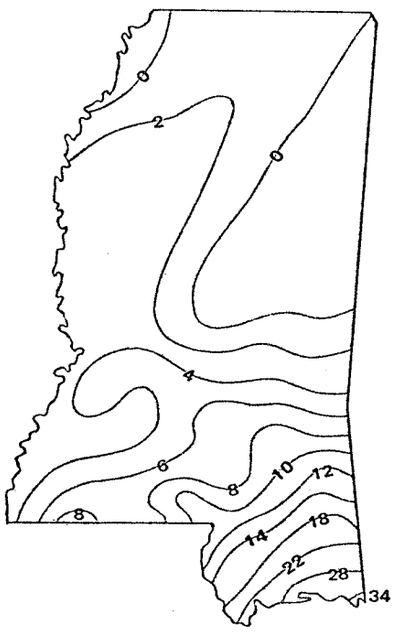


nadoes can cause considerable damage to life and property, especially if they pass over thickly settled areas. There have been, at rare intervals, days when tornadoes brought death or injury to 500 or more Mississippians. In one-third of the 20-year span 1953–1972 no deaths were recorded due to tornadoes in Mississippi.

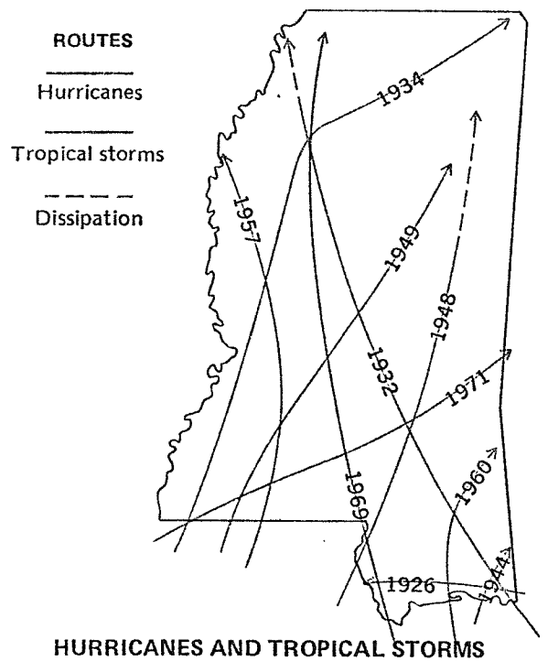
Hurricanes—Another hazard to life and property in Mississippi is the tropical cyclone which occurs from June to November. While these storms generally move into the state on the coast, they have on occasion entered Mississippi as far north as Meridian or Greenville after crossing part of Alabama or Louisiana. These latter storms are usually weakened considerably by passage over land. Loss of life and property due to high winds are mostly confined to the coastal areas, with interior losses resulting generally from rain damage to crops and from floods. Hurricanes which move inland over southeast Louisiana may be as damaging on the Mississippi coast as those which cross the coastline. This is especially true of those moving from the southeast, because of the usually more severe winds in the northeast quadrant and because of the high seas which move across the Mississippi Sound and pile up on the shore. Those which move westward offshore often cause tide and wind damage on the coast. Those which move northeastward across or south of the Louisiana Delta and move inland between Mobile and Panama City are usually less damaging because the winds are offshore and tides are subnormal. Hurricanes which move inland on the Alabama coast may affect Mississippi only slightly because of less intense offshore winds in their western portions.

The chances for hurricane-associated wind damage decreases as one goes inland, away from the Gulf of Mexico. Near the coast, sustained winds of 100 mph or more have a 100-year mean recurrence interval. The eye of Hurricane Camille crossed the Hancock County coast Sunday evening August 17, 1969, over the towns of Clermont Harbor, Waveland, and Bay St. Louis, and moved generally north-northwesterly through the coastal counties. People near the center of the eye reported its passage lasted thirty minutes or so. There were no instrument readings of the top wind velocities near the eye of Camille as she crossed the coastline.

E. J. Saltsman
Ralph D. Cross



TOTAL NUMBER OF GALE WINDS
1875 – 1959
(over 39 miles per hour)



HURRICANES AND TROPICAL STORMS
1926 – 1971

Source: National Weather Service

NATURAL VEGETATION

The pattern of major vegetation zones in Mississippi differs from that of surrounding states in having a predominantly north–south orientation. This pattern, dominated by three zones running essentially the entire length of the state, is due largely to the strong influence of the northward extension of the Gulf Coastal Plain forming the Mississippi Embayment. Even though most of the state lies within the Gulf–Atlantic Coastal Plain Province, Mississippi has an unusually rich and diverse vegetation. The vegetation types and the principal species listed herein refer to potential natural vegetation and do not necessarily reflect the pattern in certain local areas which may be highly modified by agriculture or other land-use practices.

The most prevalent Mississippi vegetation type is the Oak–Hickory–Pine Forest which covers well over half the total area. Interrupted only by two narrow strips of prairie, this zone extends in a broad, almost continuous band more than half the width of the state, from the northeast to the southwest corners. This forest type, found only in the southeastern United States, consists of a complex mixture of hardwoods and pines. With little disturbance the pines tend to be replaced by hardwoods in most areas. However, following such extreme disturbances as fire or cultivation, forests in this area often revert to essentially pure stands of pine. Occasional outbreaks of fire are thought to be a natural part of the ecology of this area, even if man-caused fires are excluded. With the additional extensive disturbance caused by man, the forested portions of this zone now contain considerably more pine than would be true under more natural conditions. The dominant trees of this area include mockernut, bitternut, pignut, shagbark, pale hickories, white oak, post oak, northern and southern red oak, black oak, blackjack oak, loblolly pine, and shortleaf pine. In wet areas yellow poplar, bay magnolia, shumard oak, live oak, willow oak, and sweetgum are common. Understory trees include dogwood, sourwood, and red bay.

Lying west of the Oak–Hickory–Pine Forest is a narrow belt of Oak–Hickory Forest which is discontinuous, but extends for the entire length of the state. This narrow vegetation zone is a southern extension of a forest type that is prevalent on relatively dry sites throughout much of the central Midwest of the United States. It is a complex forest association, and different species appear dominant in various areas throughout the geographical expanse of the forest—black oak, white oak, northern red oak, post oak, shagbark hickory, mockernut hickory, and pignut. Other dominant species that are found in Mississippi include big shellbark black hickory, bitternut, sweetgum, yellow poplar, winged elm, and hackberry. Understory species include dogwood, ironwood, sourwood, serviceberry, and black haw.

The entire length of the western boundary of Mississippi is covered by a rich southern floodplain forest, which extends from the Gulf of Mexico up the Mississippi Valley into Illinois. This forest type is also found in a much narrower band along the valleys of the Pearl and the Pascagoula rivers in southeastern Mississippi. Typical dominant species in this forest include bald cypress, tupelo gum, pecan, willow oak, water oak, shumard oak, overcup oak, and swamp chestnut oak. Understory species in this forest include red bay, rattan vine, cabbage palm, water elm, and red haw.

The Black Prairie consists of two separated bands of dark, heavy soils with associated vegetation. The first is a crescent-shaped area extending northwest to north from the Alabama line at Clarke County. On the deeper soils of this area are found red cedar, overcup oak, shumard oak, green ash, durand oak, laurel oak, and nutmeg hickory. On the thin soils of this zone are glade-like areas which contain species of prairie sunflower, prairie cornflower, prairie rose, cherokee sedge, tuberus milkweed, prairie clover, and big bluestem grass.

The southernmost part of Mississippi gives rise to an extremely rich forest known as the Southern Mixed Forest. Extending from the Gulf of Mexico north for approximately 100 miles, this forest consists of a mixture of pines and both deciduous and evergreen broadleaf trees. The species of pines include longleaf, loblolly, and slash; the broadleaf deciduous species include sweetgum, beech, yellow poplar, white oak, swamp chestnut oak, turkey oak, and cucumber tree; the evergreen broadleaf trees include bay magnolia, southern magnolia, live oak, and laurel oak. Understory species include Florida maple, gallberry, wax myrtle, ironwood, red bay, cabbage palm, dogwood, titi, and holly. On sandy sites near the coast the forest becomes more open, and the pines increase in dominancy.

Joab Thomas

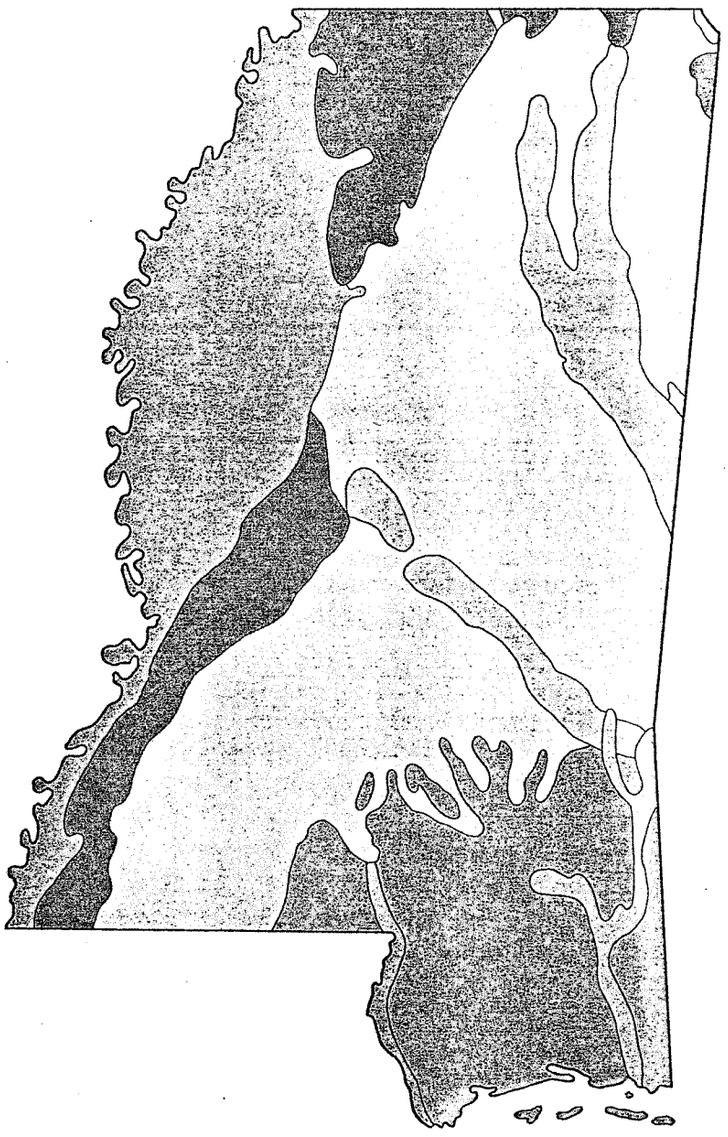
OAK-HICKORY-PINE FOREST
Species include mockernut, pignut, shagbark and pale hickories, white oak, post oak, black oak, northern and southern oak, loblolly and short leaf pine, yellow poplar, bay magnolia, and sweetgum.

OAK-HICKORY FOREST
Species include black oak, white oak, northern red oak, post oak, shagbark hickory, mockernut, pignut, and big shellbark hickory, sweetgum, yellow poplar, winged elm, and hackberry.

SOUTHERN FLOODPLAIN FOREST
Species include bald cypress, tupelo gum, pecan, willow oak, water oak, shumard oak, overcup oak, swamp chestnut oak, cottonwood, red bay, water elm, red haw, and willow.

SOUTHERN MIXED FOREST
Species include sweetgum, beech, yellow poplar, white oak, swamp chestnut oak, turkey oak, cucumber tree, bay magnolia, southern magnolia, live oak, laurel oak, ironwood, red bay, and holly.

PRAIRIE BELT
Species include red cedar, durand oak, overcup oak, shumard oak, laurel oak, green ash, nutmeg hickory, prairie coneflower, prairie rose, prairie sunflower, cherokee sedge, tuberous milkweed, and prairie clover.



GENERALIZED VEGETATION

Source: A. W. Kuchler, The National Atlas of the United States of America

SOIL RESOURCES

Mississippi is blessed with a variety of soils with great production potentials yet to be fully realized. With slightly over 30 million acres of land in the state, Mississippi has more acreage of highly fertile soil than most other states in the South. However, to increase present farm incomes and to meet future agricultural needs, good soil management will be needed on every acre of land whether it is in the fertile Delta area or in the less productive hill section.

TYPES AND USES

Geology (providing parent material), topography, climate, and vegetation have been the primary factors in the development of Mississippi's soils. The great number of soil groups, families, series, and types resulting from these and other minor factors precludes the possibility of discussing them in detail here. However, a general categorization of the state's soils is made on the basis of eight recognized land resource areas reflecting certain inherent characteristics of soil groupings.

MISSISSIPPI DELTA—Soils of the Delta Area occupy the floodplains and other depressional or basin-like areas subject to seasonal saturation with water. Comparatively, these are young soils. Having been deposited by river action, they are generally high in organic matter, plant nutrients, and weatherable minerals. These soils are contained in a region of about 5 million acres and comprise one of the nation's more highly productive land areas. The major Delta soils include Sharkey, Dundee, Commerce, Alligator, Dubbs, Forestdale, Robinsonville, Tunica, and Tutwiler.

The Delta is a prosperous and highly specialized agricultural area. Soil tests indicate that when this land is drained and fertilized, the soils are productive and well adapted to a wide range of crops. Leading crops are cotton, soybeans, grain sorghum, and rice. Vegetable yields are increasing, and this region has the potential for becoming one of the leading vegetable-producing areas of the country. It is probable that the Delta will remain a highly specialized and mechanized farming area.

BROWN LOAM (THICK LOESS)—The soils of the Brown Loam Area are developed from loess, or windblown material, generally over four feet thick. This is the most uniform soil material found in Mississippi. Because of this uniformity, the number of different soils in the Brown Loam region is small in comparison with other land resource areas. Soils of this area are all high in silt content and, especially when slopes are steep, are subject to severe erosion. The uniform parent material contains sufficient native fertility for rapid plant growth, a fact reflected in the production of forage and other crops throughout the Brown Loam Area. Hardpans or impervious layers are common in these silty soils and are classified as fragipans. The major Brown Loam soils are Loring, Memphis, Collins, Calloway, Falaya, Grenada, and Natchez.

THIN LOESS AREA—The soils of this area have developed from thin loess (less than four feet) over sandy and clayey coastal plain materials. The nearly level to sloping soils are formed in silty substances overlying loamy materials; steeper soils are formed in mainly loamy materials. The dominant soils of this type include Gillsburg, Providence, Smithdale, Arkabutla, Ariel, Bude, Ealaya, Lexington, Ruston, and Sweatman.

Soils of the floodplains, when drained, along with the gently sloping soils of the uplands are well suited for row crops. All require applications of complete fertilizers. The primary crops grown in the Thin

SOIL TERRACING USDA

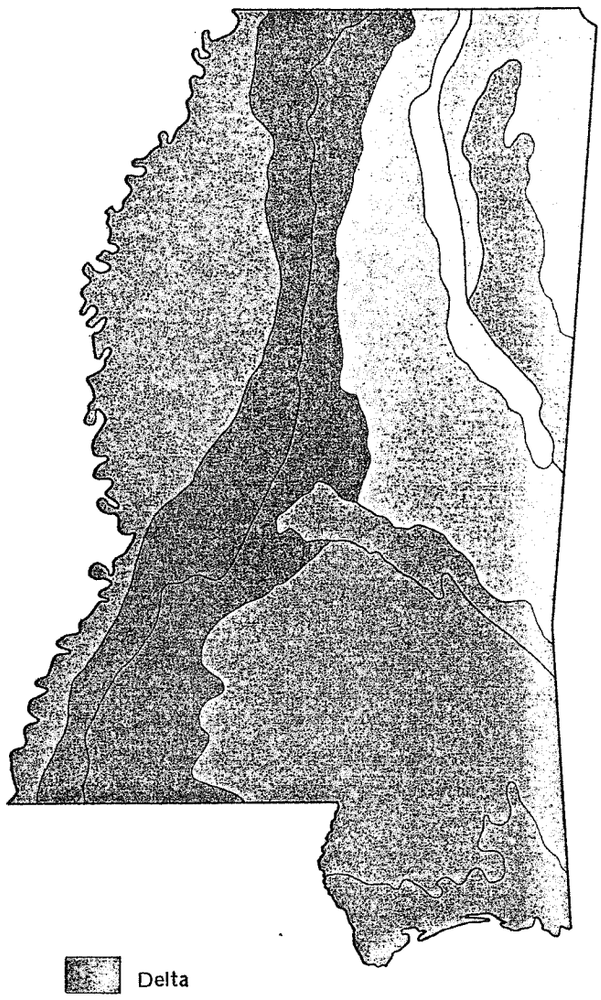
Loess Area are cotton, soybeans, corn, and grain sorghum. The soils are also well suited for forage and pasture crops. About 40 percent of the area is in woodland, primarily mixed hardwood and pine.

BLACKLAND PRAIRIES (BLACK BELTS)—The major portion of the Blackland Prairie is located in northeastern Mississippi, though a smaller area extends from Jackson southeastward to Wayne County. Most of these soils are clayey or fine in texture and many are high in lime. The sloping soils are subject to severe erosion when cultivated without adequate conservation measures. In general, they are best suited to perennial grasses and legumes, since most are difficult to cultivate because of texture and wetness. These finer textured soils which easily bog in winter months are somewhat droughty during midsummer, a disadvantage for grazing. The leading Blackland Prairie soils are Okolona, Leeper, Brooksville, Catalpa, Kipling, and Vaiden.

UPPER COASTAL PLAIN—The soils of this area are formed in loamy, clayey, and sandy materials. Their fertility status is generally low and complete fertilizers are necessary for high crop yields. The floodplains, when drained, and the gently sloping uplands are well suited for such row crops as cotton, soybeans, corn, and grain sorghum. Beef cattle, dairying, vegetable crops, and pine timber also contribute to the agricultural economy of the Upper Coastal Plain. The major soils of the area include Smithdale, Ora, Sweatman, Cahaba, Iuka, Mantachie, Prentiss, Providence, and Ruston.

INTERIOR FLATWOODS—The Interior Flatwoods is a narrow area in northeastern Mississippi, extending from Tippah County southeastward into Alabama. The soils of this area have formed in silty and clayey materials. Their fertility level is generally low and complete fertilizers are necessary for high crop yields. The soils are level to sloping, and many need draining. Major Interior Flatwoods soils are Wilcox, Falkner, Mayhew, Adaton, Arkabutla, Providence, Savannah, and Smithdale.

The Flatwoods is well suited for loblolly pine, and much of the area is used for timber production. A general type of farming is also practiced, yielding cotton, corn, soybeans, pasture grasses, and hay. Sweet potatoes are produced in small areas as a specialized crop, and, in recent years, soybeans have become the most valuable row crop.



GENERALIZED SOIL REGIONS

The Winery Rushing

Sam and Diane Rushing
Post Office Drawer F
Merigold, Mississippi 38759

(601) 748-3821

July 29, 1982

Steve Simon
BATF
Research of Regulatinns
Washington, Mississippi

Dear Steve,

Enclosed are the maps neccessary to descibe the Mississippi Delta with the referrence points that should satify the requirements.

The name of the viticultural area is the Mississippi Delta

The maps are U.S.G.S. maps labeled Helena, Greenwood, and Jackson. They are of the 1:250,000 series. These maps will determine the boundries of the Mississippi Delta.

The boundries of the Mississippi Delta are located entirely within the boundries of the state of Mississippi. The point of beginning is located on the Mississippi River some ten miles east of Southhaven, Mississippi.From there the western boundry of the Mississippi Delta will be the Mississippi-Arkansas state line. This line is located along the old natural flow of the Mississippi River and thus the reason for some of the land being on the west side of the River but still in the proposed viticultural area. The western boundry procedes through the helena map, the Greenwood map, and then into the Jackson map of the 1;250,000 series. The western boundry ends when it connects with the Illinois Central Gulf Railroad (ICG) at the point where the ICG is crossing the Mississippi River west of Vicksburg, Mississippi. This point is located on the Jackson Map of the 1;250,000 series. From this point back to the Mississippi-Tennessee line, the boundry will be the Illinois Central Gulf Railroad. The landmarks will be as follows. Procede east from the point the Mississippi-Arkansas state line and the railroad connects. This point will be in the middle of the Mississippi Riaver. Procede east toward Vicksburg along the ICG until it connects with the northbound ICG in Vicksburg. This railroad will be the western boundr of the Mississippi Delta and the landmarks of this railroad will be asfollows. From Vicksburg procede in a northerly direction to Waltersville, Kings, and Redwood. At Redwood the ICG makes a slight turn and then forks. The eastern fork or the fork that follows closest to Mississippi Highway #3 is the railroad that will continue to descibe the western boundry of the Mississippi Delta. The boundry then procedes to Piant and following the eastern spur continues to and through Eldorado, Germania, Startia, Crupp, Yazoo City, and Yazoo Junction. At Yazoo Junction procede on the eastern fork os the ICG to Renshaw, Zelleria and Eden. At this point go to the greenwood map series 1:250,000. The eastern boundry of the Mississippi Delta will then procede along the ICG railroad northerly through Bee Lake, Thornton, Good Hope, Milestone, Westfield, Shackleford, Tchula, Oswego, Keiru, Sidon, Rising Sun, Greenwood, Craigside, Money, Ruby, Philip, Sisloff Junction, Black Bayou Junction, Glendora, Whitehead and Swan Lake. North of Swan Lake the ICG forks again and the boundry will again follow the eastern railroad northerly to Mikoma. At this point go the the Helena map of the 1:250,000 series. The eastern boundry of the Mississippi Delta will procede

northerly along the ICG railroad through Brazil, Stover, Hiram, Chancy, Lambert, Marks, Burgess, Hinchcliff, Essex, Darling, Falcon, Sledge, Crenshaw, Buxton, Sarah, Savage, Dooley, Prichard, Banks, Marierrette and connecting with the ICG at Lake Cormorant. From Lake Cormorant procede northerly along the ICG through Glover, Walls and right before the Mississippi-Tennessee line is connected take the eastern spur to the Mississippi-Tennessee state line. The point the eastern Mississippi Delta boundry connects with the Mississippi-Tennessee state line will be approximately one mile east of Lake View, Mississippi. From the point that the ICG railroad connects with the state line procede westerly alone the Mississippi-Tennessee state Line until this northern boundry of the Mississippi Delta connects with the beginning point on the northwest corner of the state of Mississippi.

I hope that this will make the boundries clear. Basically the boundries are state lines and railroads which are very easy to locate on maps and in person. Please advise if there is anything else that I may need to send.

Sincerely,

Samuel H. Rushing

The Winery Rushing

Sam and Diane Rushing
Post Office Drawer F
Merigold, Mississippi 38759

(601) 748-~~3821~~ 2731

August 9, 1982

Mr. Steve Simon
Regulations of ATF
P.O. Box 385
Washington, D.C. 20044

Dear Mr. Simon,

Here is the list of grape growers that I know of that are located within the Mississippi Delta. Their address and phone number is also there.

Name, address, phone number	acres
Samuel H. Rushing P.O. Drawer F Merigold, Mississippi 748-2731	25
Mr. Thonas H. Simmons [redacted] Leland, Mississippi [redacted]	11
Mr. Frank Hegman [redacted] Holly Bluff, Mississippi [redacted]	3.5
Mr. Terry McCool [redacted] Cleveland, Mississippi [redacted]	1.25
Mr. Doona Wade [redacted] Rolling Fork, Mississippi [redacted]	.75
Mr. Lee Thompson Ruth's Flower Shop Marks, Mississippi [redacted]	2.00

Please let me know if this is all you need. The total acerage from these vineyards are 43.5. These are all located within the boundries of the Mississippi Delta.

Thank you again foryour help.

Sincerely,

Samuel H. Rushing, Jr.

The Winery Rushing
Sam and Diane Rushing
Post Office Drawer F
Merigold, Mississippi 38759
(601) 748-3821

November 2, 1982

Mr. Steve Simon
BATF
P.O. Box 385
Washington, D. C. 20044

Dear Steve,

Enclosed are the two maps that you will need in addition to the maps you already have. The other two maps are West Point and Memphis. They are both of the 1:250,000 series. I will rediscribe the "Mississippi Delta" because of the changes that have occurred in our past telephone conversations. Basically the boundries will be the Mississippi network of levees on the west instead of the Mississippi state line. The eastern boundry will change to include some land left out in the previous desciption between Greenwood and Charleston.

The name of the proposed viticultural area is still the "Mississippi Delta".

The boundries of the Mississippi Delta are located almost entirely within the boundries of the state of Mississippi. The point of beginning is located onthe Helena, Arkansas map of the 1:250,000 series. It begins at a point approximately one to two miles south of Lake Veiw, Mississippi on U.S. highway #61. This point will begin where U.S.#61 connects with the Mississippi levee system. At this point it is easy to see the northern beginning of the Mississippi Delta because of the hills contrasted next to the flat cultivated soil of the Mississippi Delta. The levee road connected with U.S.#61 will be the beginning point of the desciption. There is also a stone monument at this site. It is located approximately 50 feet from U.S. #61. Beginning at the monument procede westerly approximately four miles and then the boundry briefly crosses the Mississippi-Tennessee line before turning south and back in the Mississippi State boundry. This turn up through Tennessee can be seen on the Memphis, Tennessee map series 1;250,000. It is hard to distinguish this short line on the Memphis map but it sould be easy enough to see to put the route of the boundry in perspective. Proceding in the Helena map on the Mississippi levee procede south on the western side of small Mississippi towns of Norfolk, lake Cormorant, Penton, Clack, Commerce, Mhoon, Fox Island, Austin, Jefferies, Delta , Friers Point, Sessions, Dickerson, Humber, Sherard, Green Grove, Rena Lara, Hill House, Eldridge, Rochdale, Round Lake, and Deeson. These towns will help locate the route of the western boundry of the Mississippi Delta. The levee is generally found to the west of the towns. The next map to procede on is the Greenwood map seriss 1:250,000. Still proceding south on the levee go southerly past the towns of Concordia, Gunnison, Rosedale, Beulah, Christmas, Bolivar, Eutaw, Winterville State Park, Greenville, Refuge, Wayside, Avon, James, Longwood, and Chatham. This is all that is on the Greenwood map at this time, now go to the Jackson map series 1:250,000. On the Jackson map procede southerly down the levee on the western side of Mayersville, Tallula, Fitler, Bellevue, Brunswick, and Peelers. The levee will now procede in an easterly direction approximately five miles north of Vicksburg. The levee will cross Mississippi Highway #465 and will intersect with the Illinois Cental Gulf Railroad approximately onemile north of Twin Lakes. At the point that the levee intersects with the ICG railroad the boundry for the Mississippi Delta will follow the ICG

railroad south trough Twin Lakes. At the point between Twin Lakes and Redwood the ICG railroad that the boudry is on will turn north and go trough Plant on the eastern spur around Plant and then procede northerly through Germania, Satartia, Crupp, Yazoo City and to Yazoo Junction. At the Yazoo Junction point procede on the eastern fork of the ICG railroad to Benshaw, Belleria, and Eden. At this point the Greenwood map series 1:250,000 will be used to descibe the Mississippi Delta. The boundry of the Mississippi Delta will then procede along the ICG railroad northerly trough Bee Lake, Thornton, Good Hope, Mileston, Westfield, Shackleford, Tchula, Oswego, Keirn, Sidon, Rising Sun, and Greenwood. At the point that the ICG railroad crossed U.S. Highway #82 in Greenwood procede east on #82 until it intersects with Mississippi Highway #7. Procede north on Mississippi #7 through Crenfree, Avalon, and Leflore. At this point go to the West Point map series 1:250,000. Still proceding on the eastern boundry of the Mississippi Delta on Mississippi #7 go until the road connects with Mississippi highway #8 at Holcomb. At this point procede on Mississippi #8 in a westerly direction and then back to the Greenwood map series 1:250,000 still on Mississippi highway #8 until it intersects with Mississippi Highway #35 at Oxberry. At this point procede in a northery direction through Leverett, Payne, pass the Mississippi #32 intersection, and on to the Helena map series 1:250,000. Still on Mississippi #35 procede through Charleston in a northerly direction until it connects with Mississippi highway #322. At this intersection procede on #322 in awesterly direction through Crowder and on to Lambert. At Lambert procede north where Mississippi highway #322 connects with the ICG railroad and go north through Marks, Burgess, Hinchcliff, Essex, Darling, Falcon, Sledge, Crenshaw, Buxton, Sarah, Savage, Dooley, Prichard, Banks, and Marienette. At the point north of Marienette where the ICG railroad crosses U.S. highway #61 procede on #61 north through Wells and back to the beginning point where the monument is at the top of the levee.

Let me know if this is a little clearer or if I need to send some information.

Sincerely,

Samuel H. Rushing

The Winery Rushing

Sam and Diane Rushing
Post Office Drawer F
Merigold, Mississippi 38759

(601) 748-3821

2731

March 10, 1983

Mr. Steve Simon
Regulations of ATF
P. O. Box 385
Washington, D.C. 20044

Dear Steve:

Enclosed please find three documents supporting my position that an Appellation of Origin status should be awarded to the Mississippi Delta as outlined in my prior application. As mentioned in the letter submitted by Dr. Boris J. Stojanovic, viticultural and enological enterprises in Mississippi proved to be quite lucrative in the earlier part of this century. In an effort to revitalize this industry in the past decade, millions of dollars have been spent in this state towards viticultural research stations, such as the one located in the heart of the Delta at Stoneville, Mississippi, as well as Mississippi State University's Enology Laboratory, erected in 1976. It is doubtful that such effort and expense would have been invested were it not for the complete confidence of legislators, educators, and enologists that Mississippi is indeed capable of producing great wines. The eight national awards earned by Rushing Wines at the Wineries Unlimited Competitions of 1978 and 1979 proved this confidence well-justified, and these awards further demonstrate our great efforts to produce high quality estate bottled wines.

Aside from these considerations, however, lies the fact that the Mississippi Delta has been a natural viticultural area for centuries, long before the advent of hybrids and other grape cultivars. Among the native grapes which were then abundant in this area were the Vitis Rotundifolia, the Vitis Aestivalis, the Vitis Cinera, and the Vitis Cordifolia. Of these we cho se the Vitis Rotundifolia, or the muscadine, to produce all 6 varieties of Rushing Wine. These native American grapes are still found in abundance in the forests and riverbanks of the Mississippi Delta, which certainly should help qualify us for our own Appellation of Origin. Dr. C. P. Hegwood has provided for you the specifics regarding this prolific viticultural heritage of our area.

Finally, as Mississippi's first commercial winery since Prohibition, we greatly appreciate the significance of this application. All of the wines produced here are made from grapes grown at the winery, which is a great source of pride to us. We ask that you enable us to share this information with our consumers by approving our application for an Appellation of Origin. Sould you need further information, please notify us and we shall do our best to provide it. Thank you for your consideration and we hope to hear from you soon.

Sincerely,

Sam Rushing

DIVISION OF AGRICULTURE, FORESTRY & VETERINARY MEDICINE
OFFICE OF VICE PRESIDENT

MISSISSIPPI STATE UNIVERSITY

P. O. Box 5386
MISSISSIPPI STATE, MISSISSIPPI 39762

February 14, 1983

Mr. Sam Rushing
P. O. Box 282
Merigold, MS 38759

Dear Mr. Rushing:

It is my understanding that you have applied to the appropriate authorities for an appellation of origin for the Delta Region of Mississippi. I support your application without reservation.

As you may know, Mississippi State has a very fine teaching, research and extension program in viticulture and enology. The Mississippi Agricultural and Forestry Experiment Station has established research vineyards at four of its Branch Experiment Stations throughout the State and here on the main campus. Several hundred varieties, hybrids and selections from grape breeding programs in California, Arkansas, Florida, Alabama, Georgia, North Carolina and elsewhere are being tested at one or more of these locations. Other tests are being conducted on fertilization, weed, insect and disease control; and a variety of management practices. The person in charge of this viticulture program is Dr. Clinton Hegwood, Jr., Truck Crops Branch Experiment Station, Crystal Springs, MS. 39059

In addition to the viticulture program, the State of Mississippi has seen fit to appropriate well over one million dollars to build and equip the A. B. McKay Food and Enology Lab, devoted almost exclusively to research in the making of wines. Although Mississippi is obviously new in the field of viticulture and enology, the Enology Laboratory is the finest such university teaching and research facility in the U.S. Under Regional Project No. 00142, "Grape Germ Plasm Evaluation for Enological Utilization," involving Tennessee, Alabama, Arkansas, Florida, Georgia, North Carolina, Texas, Virginia, South Carolina and Mississippi, Mississippi State has been given the lead role in the Southern Region in enology research. The Director of the Enology Lab is Dr. Boris J. Stojanovic, Professor of Enology, P. O. Box NH, Mississippi State, MS 39762.

As you know, in the USDA/Land-Grant System the Cooperative Extension Service has responsibility for the dissemination of information to farmers or growers. Dr. Richard H. Mullenax, Extension Horticulture, P. O. Box 5426, Mississippi State, MS 39762, is the person in charge of the Extension viticulture program. The Food and Fiber Center in Extension works with the current wineries and/or persons interested in establishing wineries. Surveys conducted recently by Cooperative Extension suggest there is a substantial interest in the State for the establishment of a number of new vineyards, nurseries, and wineries.

Mr. Sam Rushing

I am sure you are aware that research results indicate substantially higher yields of grapes are possible in the Delta Region than in any other part of the State. As I recall, in trials at the Delta Branch Experiment Station one variety of Rotundiflora produced approximately 22 tons of grapes per acre. I am confident that as more information on the potential for the production of grapes in the Delta becomes available and the conversion of these grapes into wine, juice or other products, there will be a substantial increase in the acreage grown in that region.

I hope the above provides the information needed to support your appellation of origin for the Delta Region. The granting of that request would obviously make Mississippi State University's investment in its viticulture and enology teaching, research and extension programs more productive.

Thank you.

Sincerely yours,

Louis N. Wise
Vice President

LNW:bn

cc: Dr. James D. McComas, President
Mississippi State University
Mississippi State, MS 39762

Dr. Clinton P. Hegwood, Director
Viticulture Program
Mississippi Agricultural and Forestry Experiment Station
Truck Crops Branch Experiment Station
Crystal Springs, MS 39059

Dr. Boris J. Stojanovic, Director
A. B. McKay Food and Enology Lab
P. O. Drawer NH
Mississippi State, MS 39762

Mr. Richard H. Mullenax
Extension Horticulturist
P. O. Box 5426
Mississippi State, MS 39762

COLLEGE OF AGRICULTURE AND HOME ECONOMICS • AGRICULTURAL AND FORESTRY EXPERIMENT STATION
MISSISSIPPI STATE UNIVERSITY

A. B. McKay Food and Enology Laboratory
P. O. Drawer NH
Mississippi State, Mississippi 39762
Phone (601) 325-3200

February 14, 1983

Mr. Sam Rushing
Winery Rushing
Box F
Merigold, Mississippi 38759

Dear Mr. Rushing:

From our conversation of a few weeks ago I understood it that you had applied to the Bureau of Alcohol, Tobacco, and Firearms, U. S. Department of Treasury, for the establishment of Mississippi Delta as an American viticultural area in order to provide for its use as an appleation of origin on wine labels and in wine advertisements (See Industry Circular, No. 82-4, BATF, U. S. Department of Treasury). Establishment of such areas became effective on January 1, 1983. With this letter I would like to offer my unqualified support to your application.

Mississippi Delta is one of the few areas in the state where the interest of people in grape production is the greatest, and the planting of vineyards is expanding at an ever increasing rate. This seems to me to point out toward the Delta eventually developing into the grape producing area of the Southeast. Once it was almost unthinkable of having vineyards in that area due to hot climate, prevalence of diseases, etc. Presently, however, the genetics of grape breeding has progressed so much that there are resistant cultivars to most of the common diseases, and are grown successfully in our experimental vineyard at Stoneville, Mississippi, as well as throughout the area by the grape growers. I am specifically referring to French-American hybrid cultivars and even some of the vinifera cultivars show promise. There are many breeder selections that the Enology Laboratory at Mississippi State University has tested in collaboration with grape breeders in the Southeast (S-142 Regional Project) and has found that a great number of them can be grown successfully under the conditions of hot and humid climate. In fact majority of grapes grown around the world are found in hot climates.

Other recent developments in grape breeding such as the new vinifera-rotundifolia hybrids developed by Professor Harold Olmo at the University of California-Davis are showing resistance to Pierce's disease while bearing fruit typical of a respective vinifera parent. The staff of the Enology Laboratory conducts cooperative studies with Davis' scientists whereby some 200 selections are presently grown in our experimental vineyards where they are being tested for Pierce's disease resistance.

At present the Delta area does not have hundreds upon hundreds of acres of vineyards yet is has a great natural lay-out for being an American

viticultural area, particularly as it possesses a virtually inexhaustible supply of water by virtue of the Mississippi River flowing through the area, and by the availability of labor and capital.

The grape and wine research at Mississippi State University is geared toward developing information for the resurrection of the wine industry in the state, which was very viable before the Prohibition. The research at Mississippi State University is committed to assist the development of grape and wine industry in the state. Very significant progress has already been made. This is attested by the fact that five or six years ago we had practically zero acreage in the state, and now in my estimation, there are 700 to 800 acres, of which about a third to a half is distributed throughout the Delta area.

The wine industry in Mississippi is small farm oriented, and I hope that authorities will find it fit to approve Mississippi Delta area as an American viticultural area.

Sincerely,

B. J. Stojanovic
Professor of Enology and
Head of Laboratory

BJS:nr

cc: Vice President L. N. Wise
Director R. R. Foil
Associate Director A. D. Seale

AGRICULTURAL AND FORESTRY EXPERIMENT STATION

MISSISSIPPI STATE UNIVERSITY

TRUCK CROPS BRANCH EXPERIMENT STATION
CRYSTAL SPRINGS, MISSISSIPPI 39059
PHONE (601) 892-3731

February 22, 1983

Mr. Sam Rushing
The Winery Rushing
P. O. Drawer F
Merigold, Mississippi 38759

Dear Sam:

I am responding herein to your recent questions about the Mississippi-Yazoo Dalta area being a grape growing region. In an attempt to answer your questions I offer the following technical definitions to substantiate that the Mississippi Delta area is, in fact, a natural grape growing region.

Around the world grapes are grown most successfully between 34° north and 49° south latitudes. The altitude limitations for grapes are 5,000 to 6,500 feet below the timber line.

Natural grape growing areas can also be defined by the mean temperatures of the warmest and coldest months. The mean temperature for the warmest monthly period must exceed 66°F and the mean temperature for the coldest monthly period must exceed 30°F. For Stoneville, Mississippi these figures are 81°F and 45°F respectively for August and January. The minimum temperature that most native euvitis grapes can tolerate is - 15°F and -3°F for vitis rotundifolia.

The grape growing regions of California have been defined by growing degree days as follows:

Region	Growing degree days	
I	1700 - 2480	Cool
II	2520 - 2990	Moderately cool
III	3100 - 3480	Warm
IV	3500 - 3990	Moderately hot
V	4010 - 5900	Hot

Using weather data from the National Weather Service office at Stoneville, Mississippi, the Mississippi Delta area accumulates from April through October an average of 5085 growing degree days each year. I used a 16-year average (1960 to 1976) and calculated from a 50° base. By this

definition the Mississippi Delta region is the same as Region V in California.

We also know that loam to sandy loam soil is desirable for grapes and a soil containing 40% sand, 40% silt and 20% clay is ideal for grapes. There are thousands of acres of soil like this in the Mississippi Delta area. There are approximately 4.5 million acres of land in the Mississippi Delta and at least 1 million acres well suited for growing grapes.

As you can see, there are several ways to technically define natural grape growing regions and by all of these definitions the Mississippi Delta area qualifies as a natural grape growing region.

The fact that two euvitis and one muscadinia species are known to be growing indigenously in the area further substantiates this area to be a natural grape growing region.

I hope I have provided some information that you can use to support your application for an appellation of origin for the Delta region of Mississippi. If I can be of any further assistance to you in this matter, please do not hesitate to ask.

Sincerely,

C. P. Hegwood, Jr.
Horticulturist

CPH:myj

cc: Dr. Louis N. Wise, Vice President
Mississippi State University
Mississippi State, MS 39762

Dr. Boris J. Stojanovic, Director
A. B. McKay Food and Enology Lab
P. O. Drawer NH
Mississippi State, MS 39762

Mr. Richard H. Mullenax
Extension Horticulturist
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