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UNITED STATES DEPARTMENT OF COMMERCE

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BUREAU OF THE CENSUS

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SIXTEENTH CENSUS OF THE UNITED STATES: 1940

**DRAINAGE OF
ALLUVIAL LANDS**

**A Comparison of Agriculture Within and
Outside of Drainage Enterprises in the
Alluvial Lands of the Lower
Mississippi Valley**

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UNITED STATES
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SIXTEENTH CENSUS OF THE UNITED STATES: 1940

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2.—West North Central States
3.—South Atlantic States

Part 4.—East South Central States
5.—West South Central States
6.—Mountain and Pacific States

Volume II.—Statistics by Counties for Value of Farm Products, Farms Classified by Major Source of Income, and Farms Classified by Total Value of Products (three parts).

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Part 2.—Southern States

Part 3.—Western States

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II.—Size of Farms
III.—Color, Tenure, and Race of
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IV.—Farm Mortgages and Farm
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V.—Work Off Farm, Age, and
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Chapter VI.—Cooperation, Labor, Expenditures,
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Cows Milked and Dairy Products.—Number of Cows Milked, Milk Produced, Disposition of Dairy Products, and Number of Cows Kept Mainly for Milk Production, Classified by Number of Cows Milked, by Counties; with Related Data for Other Classes of Livestock and Livestock Products for the States and also for the United States (one volume).

Special Cotton Report.—Cotton Harvested by Number of Bales Harvested, and by Counties, with Acreage and Production of Cotton, and Value of Farm Products (one volume).

Special Cross-line Acreage Report.—Farms Reporting and Acreage by Place of Enumeration and by Location of Acreage, with Relationship to All Farms, by Counties: 1940 and 1935 (one volume).

Drainage Monograph.—A Comparison of Agriculture Within and Outside of Drainage Enterprises in the Alluvial Lands of the Lower Mississippi Valley (paper bound).

Irrigation Monograph.—A Tabular and Graphic Presentation of Specified Irrigation Census Statistics (paper bound).

¹Agriculture volumes I and II and the volumes "Irrigation of Agricultural Lands" and "Drainage of Agricultural Lands" are comprised of State bulletins. Separate bulletins for each State are available. Separate chapters of Agriculture volume III are also available.

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A COMPARISON OF AGRICULTURE WITHIN AND OUTSIDE OF DRAINAGE ENTERPRISES IN THE ALLUVIAL LANDS OF THE LOWER MISSISSIPPI VALLEY

By Roger D. Marsden

INTRODUCTION

SCOPE AND PURPOSE OF THE STUDY¹

The region with which this study deals is that comprising the flood plain of Mississippi River from the vicinity of Cape Girardeau, Missouri, to the Gulf of Mexico. Included in the study is the valley of Red River in Louisiana and Arkansas, although this stream at Alexandria, Louisiana, is above flood level of the Mississippi. Maps showing the principal physiographic features of the region, the boundaries of the alluvial lands, and the lands included in drainage enterprises, are shown on pages 4 to 10.

The purpose of the study is to discover what differences in agricultural conditions and practices there may be between the lands included in drainage enterprises organized to benefit agriculture and the lands not so included, in the region named, as shown by the 1940 Census of Agriculture.

GENERAL DESCRIPTION OF THE AREA

The alluvial area herein discussed is about 600 miles long extending from Cape Girardeau, about 125 miles below St. Louis, Missouri, to the Gulf of Mexico, and is mostly between 30 and 100 miles wide, exclusive of Red River Valley. The latter in Louisiana and Arkansas extends some 230 miles above Alexandria, Louisiana, and its alluvial lands are generally 8 to 10 miles in width. The boundaries mapped (pages 4 to 10) are as determined by the War Department,² except on Red River above Alexandria for which the boundaries are those indicated by the Department of Agriculture³ for bottom-land soils.

Between Mississippi River and the escarpment forming the west boundary of the alluvial area are certain elongated areas that stand above the surrounding bottom lands. (See map, page 4). Longest and highest of these is Crowley's Ridge which, including detached portions at either end, extends from Cape Girardeau to the vicinity of Helena, Arkansas. In places, this ridge rises 150 feet or more above the adjacent bottoms. It has been subject to erosion by streams, and has been cut entirely across by Little and Castor Rivers in Missouri, by St. Francis River at the Missouri-Arkansas boundary, and by L'Anguille River near the southern end. Second in extent is Macon Ridge, which separates Boeuf River and Bayou Macon in Chicot County, Arkansas, and in West Carroll, Richland, and Franklin Parishes, Louisiana. In elevation, this highland is not comparable to Crowley's Ridge, nor are the others outlined on the map.

The flood plain of lower Mississippi River is divided naturally into five basins, herein referred to as follows: (1) St. Francis-White Basin, comprising the lowlands on the west side of the Mississippi from Cape Girardeau to Arkansas River; (2) Yazoo Basin, on the east side of the Mississippi between Memphis, Tennessee, and Vicksburg, Mississippi; (3) Black River Basin, in southeast Arkansas and northeast Louisiana, from Pine Bluff on the Arkansas to Red River; (4) Red River Basin, in Arkansas, Texas, and Louisiana, from the west Arkansas State line to the junction of Red River with the Mississippi; and (5) Atchafalaya-Mississippi Basin, comprising the alluvial lands in Louisiana southward from Red River to the Gulf, including those naturally subject to overflow from the Mississippi and from the Atchafalaya. The St. Francis-White Basin as described includes a small acreage that is drained into Arkansas River or directly into Mississippi River. The alluvial lands in Illinois, Kentucky, and Tennessee, and in Mississippi and Louisiana between Vicksburg and Baton Rouge are so narrow that data for them cannot be segregated in the Census statistics.

Soils of the alluvial lands.—The Department of Agriculture has designated⁴ the lowland soils of this region as alluvial, and the higher included lands of Crowley's Ridge and Macon Ridge as Memphis-Grenada. Soils of the latter classification border the alluvial lowlands on the east, from Illinois to Louisiana, but on the west for only a part of the length of Atchafalaya River.

Concerning the "Southern alluvial soil areas" (from South Carolina to mid-Texas), it is stated:⁵

The largest area of alluvial soils in the United States is along the Mississippi River below the mouth of the Ohio. * * * These soils occupy mainly first bottoms and low second bottoms and are subject to rather frequent and heavy overflow. They are almost flat, and drainage ranges from fairly good to poor. The land, where uncleared, has a covering of oaks, hickory, gums, beech, ash, cypress, holly, ironwood, cottonwood, and pine.

These soils come from a great variety of soil materials. They are, for the most part, inherently fertile, and where drained and protected from overflow are highly productive. There is a range of soil texture from sand to clay. The alluvial soils of the lower Mississippi Valley * * * are commonly of finer texture and more fertile than the soils of the Coastal Plain. Among the more important soils of the Mississippi flood plain are the Sharkey, Sarpy, and Yazoo soils. * * *

Cotton and corn are the most important crops on these soils. Cotton is the chief crop on the Mississippi Delta, and large yields are obtained without fertilization.

The area mapped as alluvial in the lower Mississippi Valley corresponds with that designated, on the basis of natural vegetation, cypress-tupelo-red gum lands (riverbottom forests), described as follows:⁶

The bottom-land areas are occupied by forest stands which near the Gulf coast are characterized by the presence of cypress, red gum, tupelo, yellow oak, over cup oak, and cow oak, and farther north by cottonwood, silver maple, white elm, river birch, sycamore, box elder, and ash. In most of the river bottoms there are distinguished three situations, namely, the "glades," the "ridges," and the "back sloughs." The sloughs remain under water during the larger part of the growing season and their characteristic forest growth is cypress and tupelo gum. The glades are those parts of bottoms which are subject to overflow for from a few weeks to several months. They support a forest of cypress, tupelo, water ash, cottonwood, and white and red bays. The ridges are often irregularly divided by lower ridges, seldom over 6 feet in elevation, and often sloping imperceptibly to the level of the glades. They support a forest made up of red gum, slash pine, over cup oak, water oak, hickory, black gum, ash, red maple, and honey locust. In the poorer drained swamps with highly acid soils tupelo usually is absent and the pond pine, or black gum and pine, make up the stand.

Flood protection.—The lands in these drainage basins are protected in considerable measure from overflows of the Mississippi and other rivers by levees, largely constructed or controlled by the Federal Government through the Mississippi River Commission. Along the east bank of Mississippi River, such levees extend from the hills at the southern Tennessee line to within a few miles of Vicksburg at the mouth of Yazoo River, and from high land at Baton Rouge practically to the mouth of the river. Elsewhere the alluvial lands east of the river are relatively very narrow. On the west bank, levees extend from the hills near Cape Girardeau to the mouth of White River, with openings at New Madrid and Helena to give outlet for St. Johns Bayou and St. Francis River; from Pine Bluff along the south bank of Arkansas River and along the Mississippi to Red River; and from thence to the mouth of the Mississippi. Levees at some distance on each side of Atchafalaya River have been built from Red River to the Gulf, and connected to those along Mississippi River. Other levees have been built at places on the tributary streams.⁷

At each of the interruptions in the line of levees along Mississippi River, high floods spread over large areas that

¹Special acknowledgment is due John A. McKnight for the assembling of data and the preparation of tables. Acknowledgment is made of the cooperation of representatives of the United States Department of Agriculture, the Department of the Interior, the War Department, the State conservation departments, and of the Division of Statistical Standards, Bureau of the Budget. ²Maps by Mississippi River Commission, 1928; scale 1:250,000. ³Atlas of American Agriculture, 1936; Soils, plate 5. ⁴Yearbook of Agriculture, 1938, map of soil associations. ⁵Ibid., pp. 1184-85. ⁶U. S. Department of Agriculture, 1936; Atlas of American Agriculture, Natural Vegetation, fig. 2 and p. 14. ⁷For plans of flood protection on Mississippi River and tributaries by the Federal Government, and amendments as adopted, see reports of the Chief of Engineers, U. S. Army, and public laws of the Congress.

otherwise would be available for development and agricultural use. When Atchafalaya River receives a large flow from the Red, a broad area along its middle and lower course above Morgan City, Louisiana, is inundated. These backwater areas as mapped by the Mississippi River Commission* for the flood of 1929 are shown on the maps, pages 4 and 5. The extent of these, omitting the larger water areas included and the lands between the levees and the river channel, is approximately as follows:

	Acres
St. Johns Bayou, Mo.-----	105,000
St. Francis River, Ark.-----	280,000
White and Arkansas Rivers, Ark.-----	650,000
Yazoo River, Miss.-----	800,000
Black and Red Rivers, La.-----	1,280,000
Atchafalaya River, La., north of Bayou	
Teche and Bayou Boeuf at Morgan City, La.-	1,110,000

Levees have been constructed entirely around some 150,000 acres of the White River backwater area, and to reduce the backwater area on Atchafalaya River by perhaps 520,000 acres. Plans have been adopted for levees to protect about 630,000 acres in the Yazoo River backwater area, against all but extreme floods and about 230,000 acres of land in the Red River backwater area between Black and Tensas Rivers and the Mississippi.

DRAINAGE ENTERPRISES

To enable or encourage cooperation among owners of wet and overflowed lands in the construction of ditches and other works that would be of common benefit, all of the States of this region have enacted general laws for the establishment of drainage districts. The first general drainage district laws in the lower Mississippi Valley were enacted in 1859 in Missouri, 1888 in Louisiana, 1891 in Arkansas, and 1898 in Mississippi.⁶ Prior to these dates, certain drainage districts were created in some of these States by special acts of the legislatures.

Such districts are established, under the laws in effect in 1940, upon petition from landowners who will be assessed to pay for the improvement works, by decree of the circuit courts in Missouri, the county or circuit courts in Arkansas, the chancery courts in Mississippi, and the parish police juries in Louisiana, after public hearing and determination that the proposed drainage will be a public benefit and will not cost more than the value of the benefits. After establishment of the district, management is vested in a board of commissioners or supervisors selected by or for the interested landowners, empowered to obtain construction of the works, to collect the costs thereof by levies against the lands benefited, and to issue bonds of the district in anticipation of assessments to be collected.

The Census of Agriculture in 1940 did not collect information as to drainage by the farm owners, and the Census of Drainage 1940 related particularly to enterprises organized under State drainage laws. However, the Census of Drainage did include data on operations that drained as much as 500 acres each undertaken by individual farm owners, partnerships, and by corporations organized under other than State drainage laws, and such enterprises are included with the others in determining the drainage areas considered in this study.

The extent of drainage enterprises within the boundaries of the alluvial lands as shown on the maps herein, including those on such elevated portions as Crowleys and Macon Ridges, and including the private drainage enterprises, is approximately 10,500,000 acres, and the capital invested therein about \$102,000,000. The distribution by counties or parishes in each of the 5 drainage basins is shown in table 1.

METHOD OF STUDY

Selection of areas to be compared.—Determination of what lands are included in drainage enterprises was made by the Census of Drainage, which collected and tabulated the information with respect to counties only. The data concerning individual farms were collected by the Census of Agriculture, and no indication was obtained as to which farms were situated within and which outside of drainage enterprises. The farm data were collected and tabulated with respect to minor civil divisions—designated civil townships in Arkansas and Missouri,

police jury wards in Louisiana, and beats in Mississippi—but most drainage enterprises include land in more than one minor civil division although relatively few include all of any one such division. Therefore, comparison of the statistics of agriculture for areas not comprising entire counties must be made on a basis of minor civil divisions.

To admit to the comparison only those minor civil divisions wholly included in drainage enterprises and those divisions including no land whatever in such enterprises would limit the areas compared to an unduly small portion of the entire area being considered. On the other hand, if there is any general difference in agriculture between land in drainage enterprises and land outside such enterprises, because of such inclusion or exclusion, tabulation of each minor civil division partly in drainage enterprises with either the drainage or the nondrainage group would tend to minimize or obliterate such differences.

As the most practicable compromise, it has been assumed that agriculture within drainage enterprises is represented by the census of those minor civil divisions that are each three-fourths or more included in such enterprises, and that agriculture outside of drainage enterprises is represented by the census of those minor civil divisions that are not more than one-fourth included in such enterprises. The comparison presented herein is based on this assumption. The areas compared are shown on the drainage-basin maps, pages 6 to 10.

Those minor civil divisions that were more than 25 percent but less than 75 percent included in drainage enterprises have been omitted from both the "drainage" and the "nondrainage" areas that are compared, and so are those divisions that are mostly, or in considerable part, outside the alluvial area or on the ridge lands mapped.

Presentation of the statistics.—The items of agricultural data that are compared for the drainage and nondrainage areas comprise Census of Agriculture statistics relating to number of farms, acreage in farms, use of the land, farm facilities and equipment, and color of farm operators; value of farms (land and buildings), of buildings alone, and of implements and machinery; major items of livestock and crops; values of farm products; work off the farm for pay or income; specified farm expenditures; mortgage debt status; and farm taxes. These data are presented by drainage basins and by counties or parishes in 9 tables. With the figures for the drainage and the nondrainage areas are shown also county or parish totals for comparison. Percentages for numbers of farms reporting the various items and for areas used for particular purposes, average values per farm and per acre, and average yields of certain crops are presented in order that correct comparisons may be made.

The Census law requires that the information be not published in such manner as to disclose operations of an individual farm or enterprise. This necessitates that each item of data shown be for not less than 3 farms or enterprises together. For some counties or groups of minor civil divisions, the original tabulations showed only 1 or 2 farms reporting certain items. In such cases the data have not been shown separately. Where there was more than 1 such county in the same State and drainage basin, which together included 3 or more farms reporting the particular item, the undisclosed data have been included in the State and basin total figures although not in the counties. Where data for at least 3 farms could not be so combined, they have been omitted entirely from the county, State, and basin figures. In similar instances regarding drainage enterprises, combinations of counties have been made in such manner that disclosures have been avoided. In all such cases, the combinations in the tables have been indicated by appropriate footnotes.

DEFINITIONS AND EXPLANATIONS

The following definitions and explanations are practically those used in the publications of the Census of Agriculture, 1940, and some are phrased as the instructions to enumerators:

A separate schedule was required for every farm.

The Agriculture Census of 1940, in accordance with the law, was taken as of April 1, 1940; consequently all inventory items relate to that date. Crop and livestock productions, unless specifically noted otherwise, are for the calendar year 1939.

* Alluvial Valley of the Mississippi River; edition of 1935, scale 1:500,000.

⁶ Reports of the Fourteenth Decennial Census, vol. VII, p. 354.

A farm, for Census purposes, is all the land on which some agricultural operations are performed by one person, either by his own labor alone or with the assistance of members of his household, or hired employees. The land operated by a partnership is likewise considered a farm. A "farm" may consist of a single tract of land, or a number of separate tracts, and the several tracts may be held under different tenures, as when one tract is owned by the farmer and another tract is rented by him. When a landowner has one or more tenants, renters, croppers, or managers, the land operated by each is considered a farm. Thus, on a plantation the land operated by each cropper, renter, or tenant should be reported as a separate farm, and the land operated by the owner or manager by means of wage hands should likewise be reported as a separate farm.

Do not report as a farm any tract of land of less than 3 acres, unless its agricultural products in 1939 were valued at \$250 or more.

A "farm operator," according to the Census definition, is a person who operates a farm, either performing the labor himself or directly supervising it. For all practical purposes, the number of farm operators is identical with the number of farms.

Farm operators are classified as "white" and "nonwhite." White includes Mexicans and nonwhite includes Negroes, Indians, Chinese, Japanese, and all other nonwhite classes.

Full owners own all the land they operate.

The term "farms reporting," as used in the tables, indicates the number of farms for which the specified items shown in the particular table were reported. If there were 1,922 farms in a county and only 1,465 of these had chickens on hand over 4 months old, April 1, 1940, and the enumeration of that item was complete, the number of farms reporting chickens for that year would be 1,465.

The acreage designated as "all land in farms" includes considerable areas of land not actually under cultivation and some land not even used for pasture or grazing, but all such land must have been under the control of the operator and considered a part of his farm. However, large areas of timberland or other nonagricultural land held by an operator of a farm as a separate business, and not used for pasture or grazing, or for any other farm purpose, were to be excluded. Land neither owned nor leased but from which crops, including wild hay, were harvested was to be reported as part of the farm. When cattle, sheep, or other livestock were grazed or pastured on land neither owned nor leased by the operator, such land was not to be included as a part of the farm.

In 1940, data were secured for six classes of land based upon the use made of the land in 1939, as follows:

1. Cropland harvested.—The land from which cultivated crops were harvested; land from which hay (including wild hay) was cut; and land in small fruits, orchards, vineyards, nurseries, and greenhouses. Where two or more crops were harvested in 1939 from the same acreage, such acreage was included only once in the acreage for cropland harvested. However, the acreage and the quantity of each individual crop were reported separately as crops harvested. Thus, in some counties the total of the acreage of crops may greatly exceed the acreage designated as cropland harvested.

2. Crop failure.—The land from which no crop was harvested in 1939 because of destruction by wind, hail, drought, floods, insects, disease, or from any cause, or failure to harvest because of low prices or lack of labor. If a crop was harvested, even though the yield was very low, the land from which the crop was actually harvested was included in the acreage for cropland harvested, not crop failure. The acreage designated as crop failure does not represent the entire acreage of crops which failed, but only that acreage of land in crops that failed and which was not successfully replanted to a crop that was harvested in 1939.

3. Cropland lying idle or in summer fallow.—Cropland which was lying idle or which was in cultivated summer fallow; or land on which crops were planted for soil improvement or the prevention of erosion, and which was not pastured, or from which no crop of any kind was harvested in 1939.

4. Plowable pasture.—Land used only for pasture in 1939 which

could have been used for crops without additional clearing, drainage, or irrigating. (Land from which a crop was harvested in 1939 but which was later used for pasture was included under cropland harvested rather than under pasture land.)

5. Woodland.—All farm wood lots or timber tracts, natural or planted, and cut-over land with young growth, which has or will have value as wood or timber. Chaparral and woody shrubs were to be omitted.

6. All other land in farms.—This classification includes pasture land other than plowable and woodland pasture, all wasteland, house yards, barnyards, feed lots, lanes, roads, etc.

Farm values.—The enumerators were instructed to obtain from each farm operator the total value of the farm (land and buildings). This total value was to be reported in accordance with the market value. In deriving the average value per farm, it has always been assumed that the total value should be divided by the total number of farms. This has been done * * *.

The operator was also asked to give the value of all farm buildings on the farm. These values were necessarily the nearest approximation the farm operator could give, and the figures obtained are probably somewhat less satisfactory than the figures for the total real-estate value; in other words, the value of the buildings should not be subtracted from the total value of the farm and the difference assumed to represent accurately the market value of the land alone.

Finally, the operator was asked to place a value on the farm implements and machinery used in operating the farm. This was to represent the present market value and was to include not only the farm implements but also the tools; automobiles; tractors; motortrucks; trailers; wagons; harnesses; dairy equipment; cotton gins; threshing machines; combines; apparatus for making cider, grape juice, and sirup, and for drying fruits; and all other farm machinery. However, the values of commercial mills and factories, also permanently installed irrigation and drainage equipment, were mentioned specifically to be omitted.

For convenience, the term "livestock" in the Census Reports is made to include not only domestic animals, such as horses, mules, cattle, swine, sheep, and goats, but also fur-bearing animals kept in captivity, poultry, and bees. It follows, then, that the term "livestock products" should include production from the above classes.

The farm mortgage inquiries were to be answered by operating owners only, and were not intended to ascertain the actual acreage under mortgage.

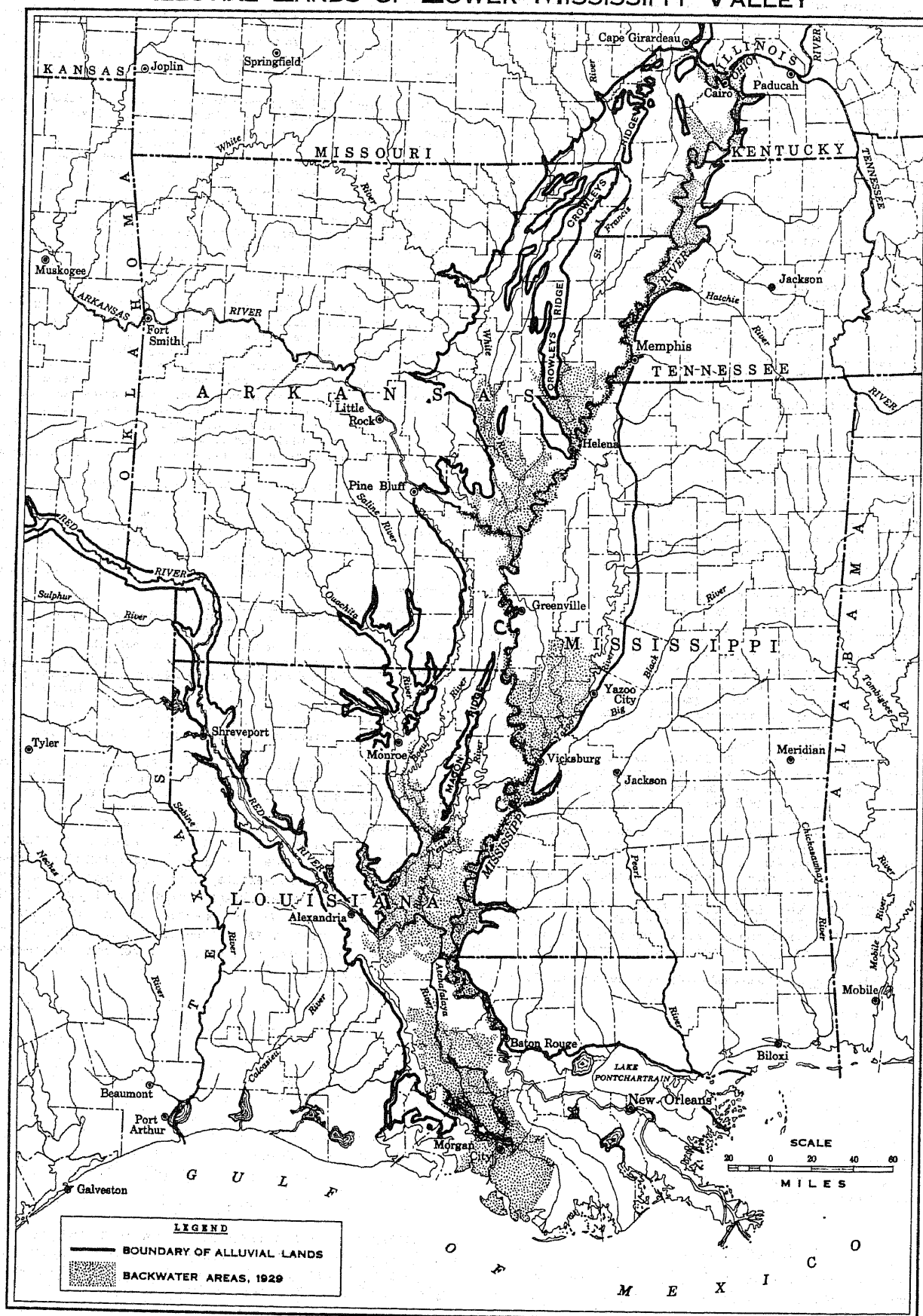
The inquiry concerning taxes, on the Farm and Ranch Schedule, was specifically applied to real estate, including farm buildings and other improvements but not taxes levied by drainage districts.

Farm expenditures for labor represent only the amounts paid in cash, although for certain types of labor, cash payments often are supplemented with the furnishing of board, housing, feed and pasturage for animals, or products of the farm for use of the laborer's family. For all farm expenditures other than labor, the enumerators were instructed to include obligations incurred as well as cash paid out, and to include contributions made by the landlord with those made by a tenant operator.

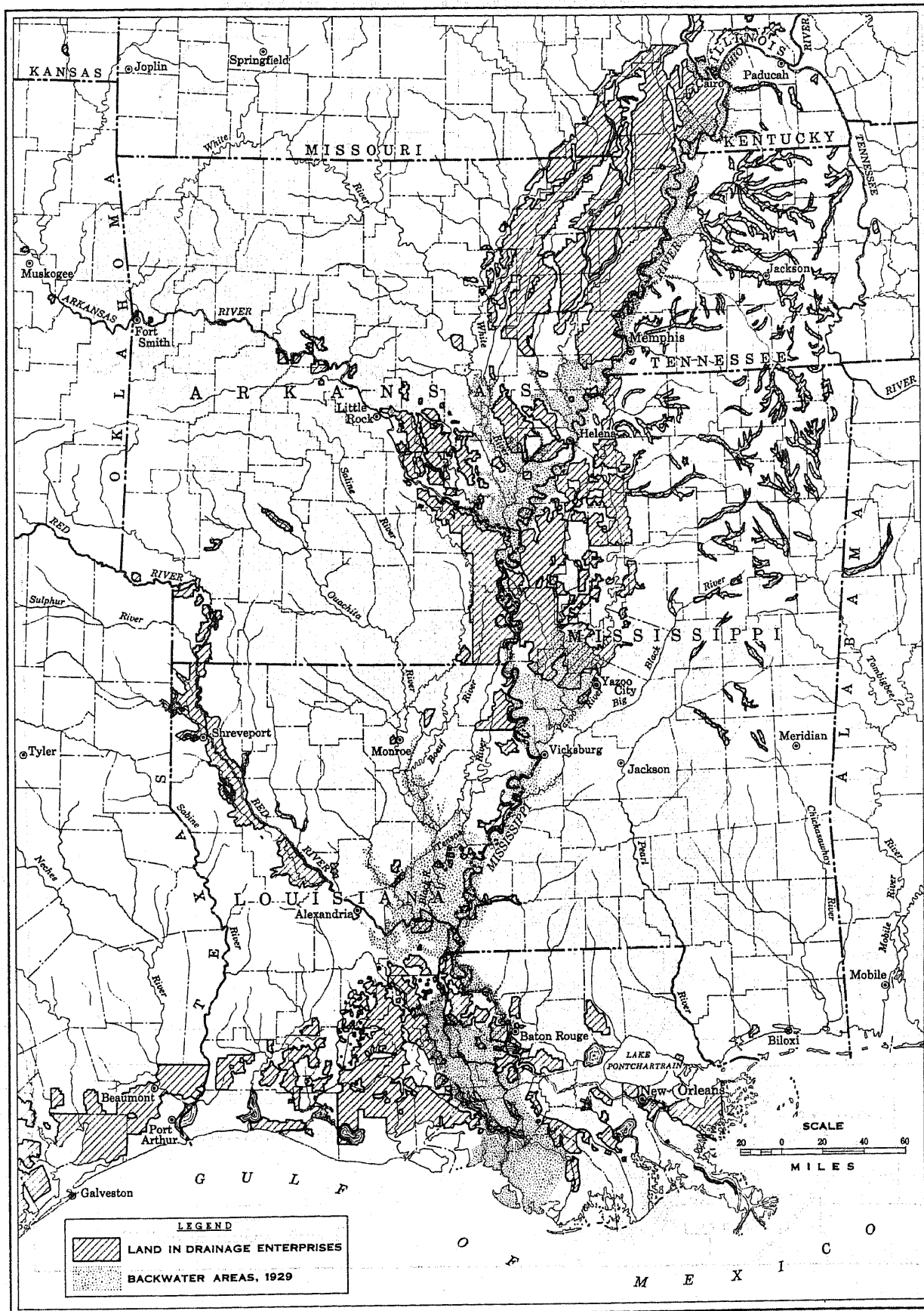
The inquiry for the amount of expenditures for farm implements and machinery specified the inclusion of expenditures for automobiles, tractors, and motortrucks, while that for expenditures for building materials specified the inclusion of lumber, roofing materials, hardware, cement, paint, fencing material, etc., for use on the farm.

The figures for drainage taxes, in table 10, are taken from the Census of Drainage. They represent taxes collected in 1939, whereas the real-estate taxes determined from the Census of Agriculture represent taxes levied in that year. The average drainage tax shown is computed on the entire acreage in all drainage enterprises in the county, including the enterprises that collected no taxes, to approximate an average annual drainage tax.

ALLUVIAL LANDS OF LOWER MISSISSIPPI VALLEY

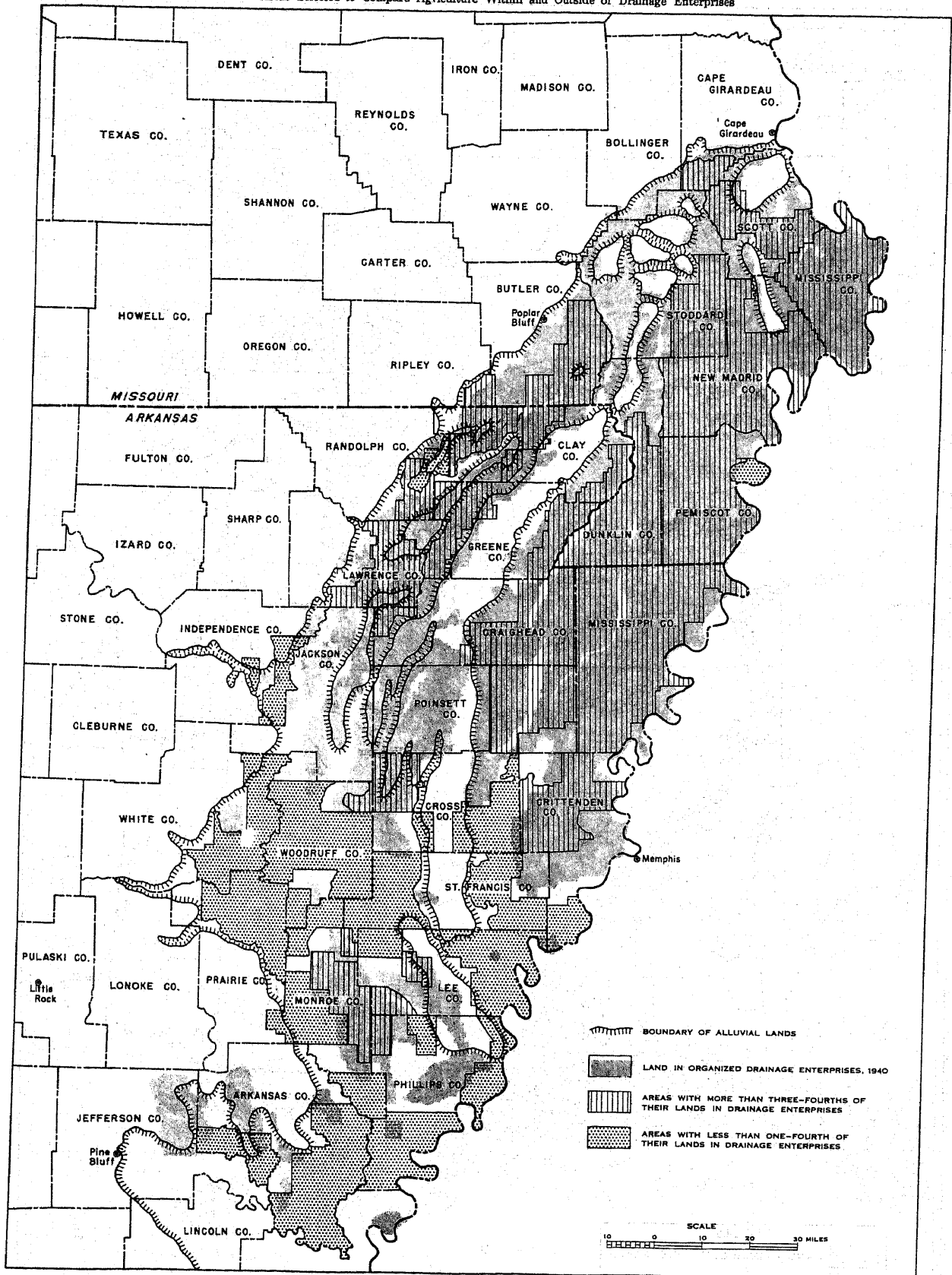


DRAINAGE ENTERPRISES IN LOWER MISSISSIPPI VALLEY



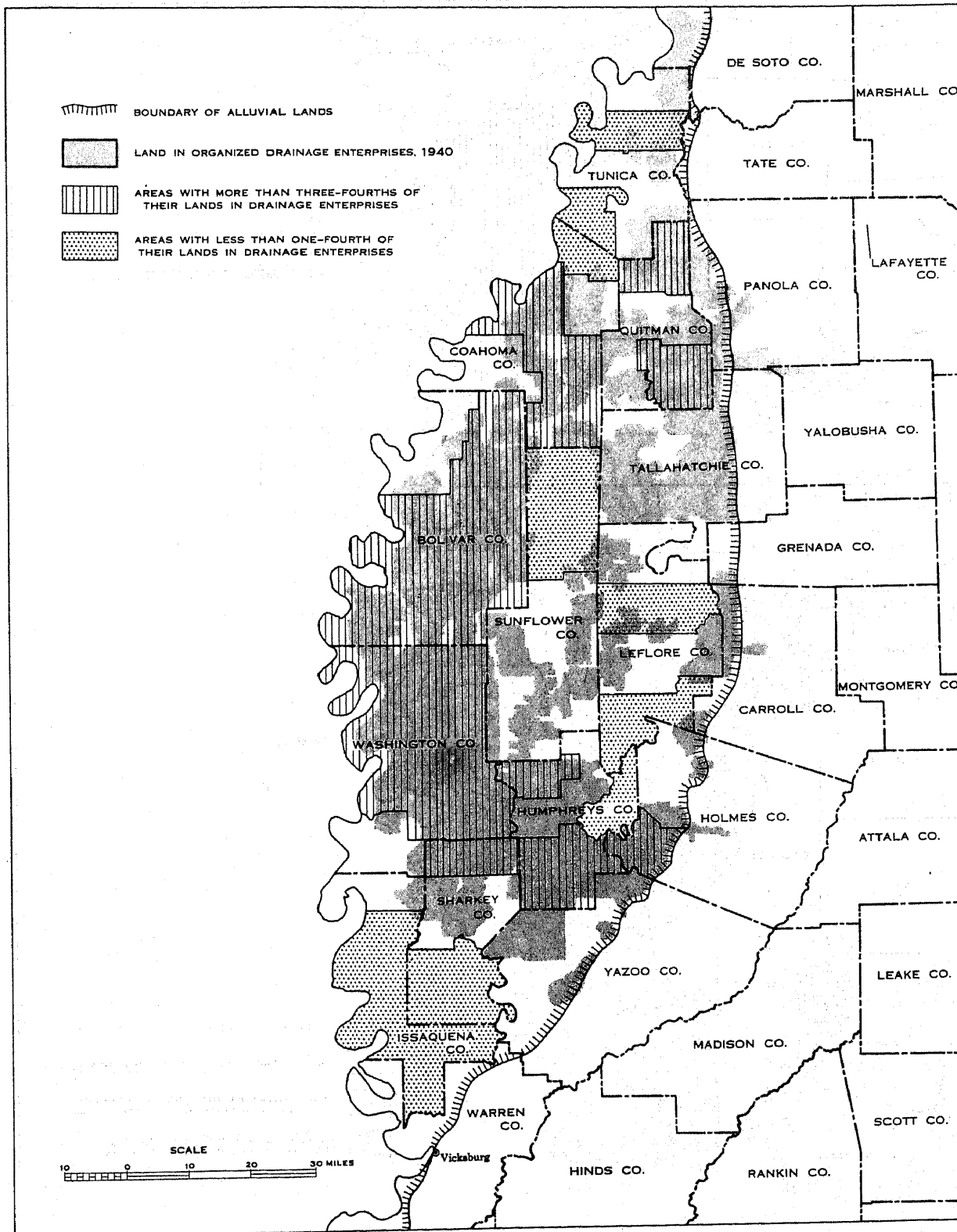
ALLUVIAL LANDS IN ST. FRANCIS-WHITE BASIN, MISSOURI-ARKANSAS

Areas Selected to Compare Agriculture Within and Outside of Drainage Enterprises



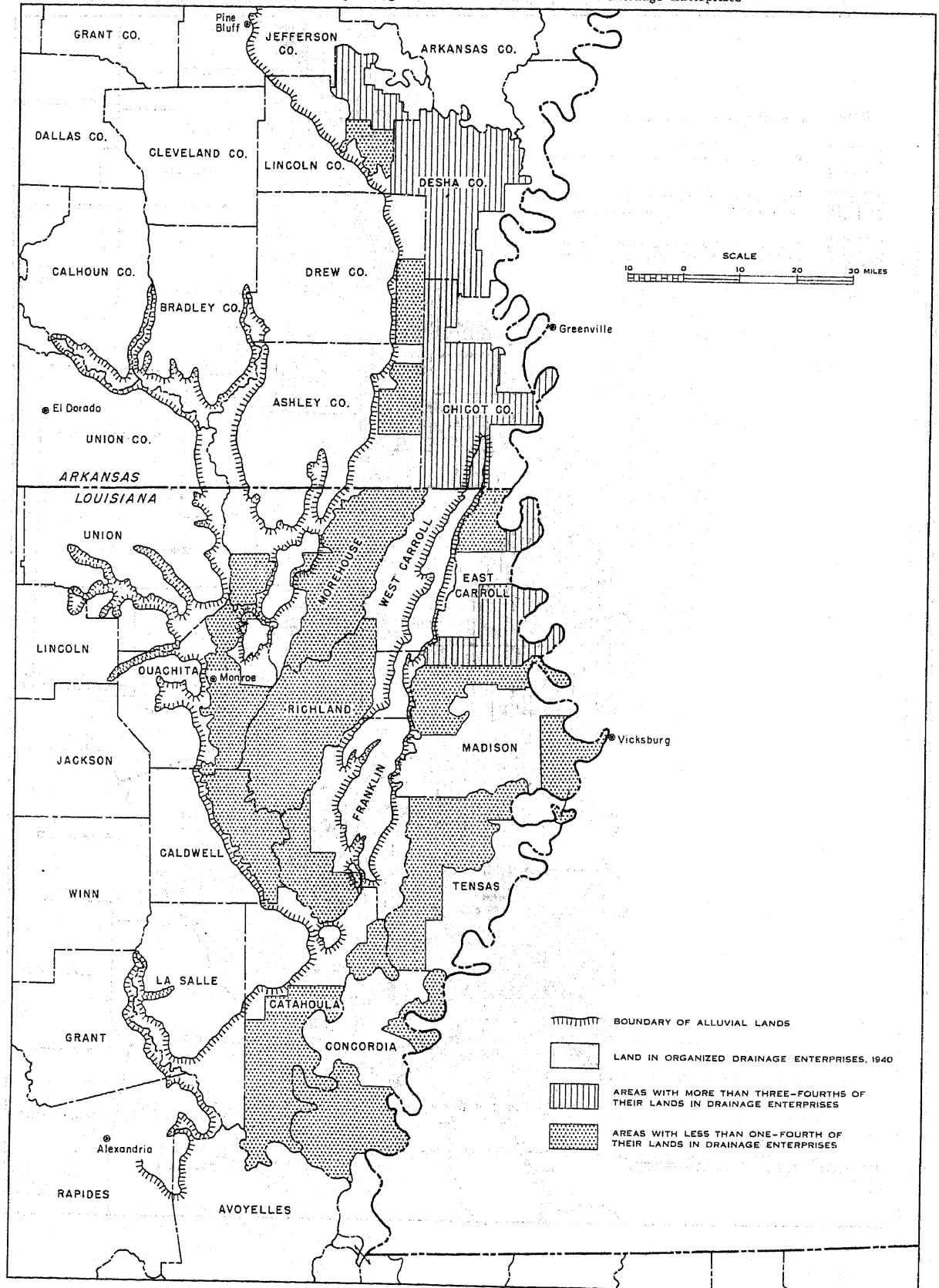
ALLUVIAL LANDS IN YAZOO BASIN, MISSISSIPPI

Areas Selected to Compare Agriculture Within and Outside of Drainage Enterprises



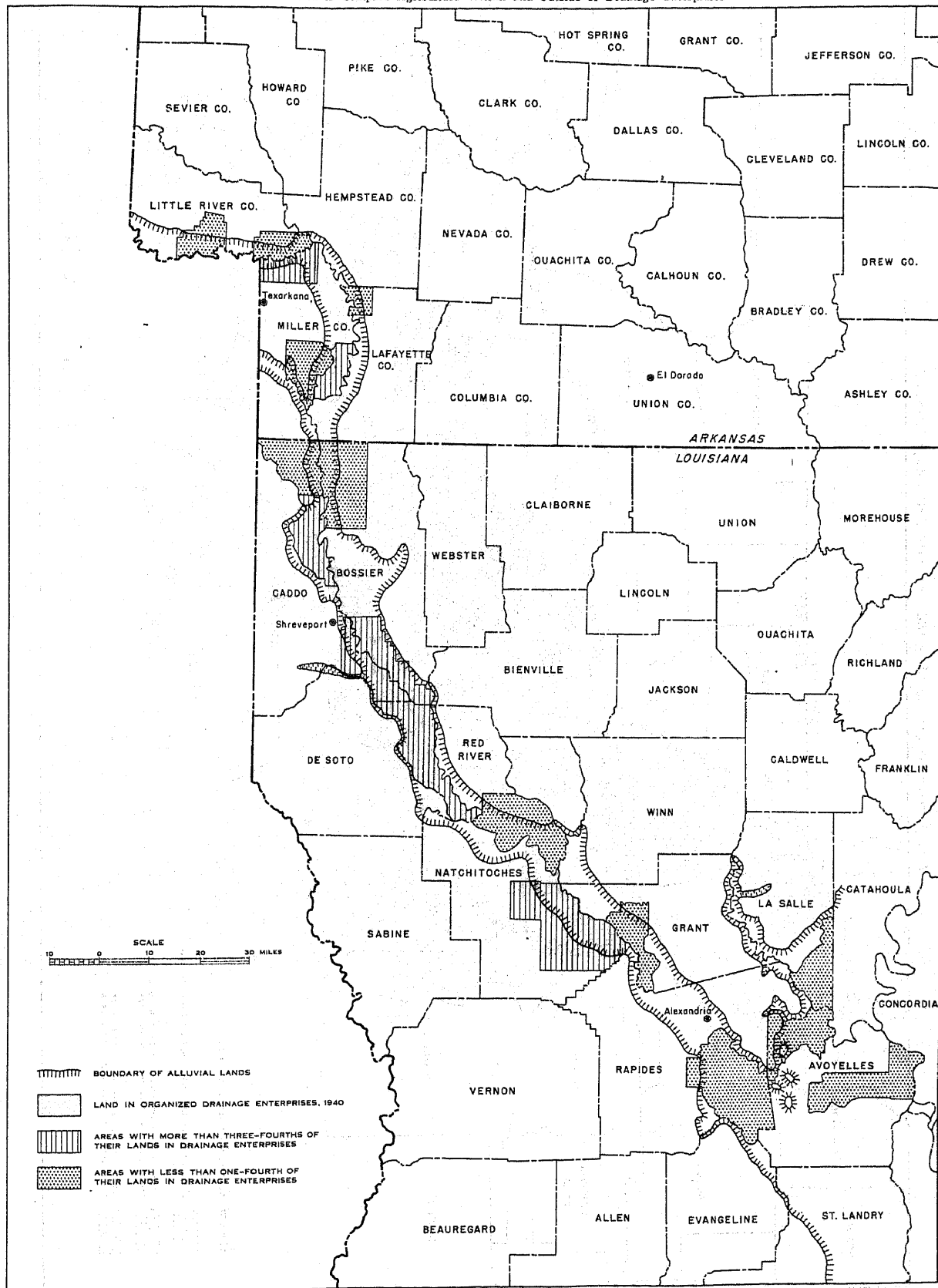
ALLUVIAL LANDS IN BLACK RIVER BASIN, ARKANSAS-LOUISIANA

Areas Selected to Compare Agriculture Within and Outside of Drainage Enterprises



ALLUVIAL LANDS IN RED RIVER BASIN, ARKANSAS-LOUISIANA

Areas Selected to Compare Agriculture Within and Outside of Drainage Enterprises



Areas Selected to Compare Agriculture Within and Outside of Drainage Enterprises

