

Magnesium plus Calcium to Bicarbonate

The areal distribution of the milliequivalent ratio of magnesium plus calcium to bicarbonate ($Mg+Ca/HCO_3$) in water from the middle Claiborne aquifer shows that the ratio ranges from less than 0.61 to 24 (table 1). The $Mg+Ca/HCO_3$ ratio appears to decrease from the outcrop area to the midbay area of the aquifer and then increases in the area near the downdip limit of the data (fig. 17).

From the Sabine uplift eastward to the southwestern corner of Alabama the $Mg+Ca/HCO_3$ ratio in the middle Claiborne aquifer ranges from about 0.50 to greater than 1 in the outcrop area, decreases to about 0.10 in most of the area between the outcrop and the downdip limit of the data, and then increases to greater than 10 near the downdip limit of the data in central Louisiana and southeastern Mississippi. From the Sabine uplift southward to the San Marcos arch the $Mg+Ca/HCO_3$ ratio generally ranges from 0.50 to 5 in the outcrop area and decreases to a range of 0.10 to 1 in the midbay and downdip areas. From the San Marcos arch southward to the Rio Grande the $Mg+Ca/HCO_3$ ratio ranges between 1 and 5 in the outcrop area and decreases to less than 0.10 in parts of the midbay area and then increases to more than 10 in the downdip area of southern Texas.

Magnesium plus Calcium to Sodium plus Potassium

The areal distribution of the milliequivalent ratio of magnesium plus calcium to sodium plus potassium ($Mg+Ca/Na+K$) in water from the middle Claiborne aquifer shows that the ratio ranges from less than 0.61 to 13 (table 1). The $Mg+Ca/Na+K$ ratio generally decreases from the outcrop to the downdip limit of the data except in the northern part of the Mississippi embayment aquifer system area where the ratio decreases from west to east (fig. 18).

From the Sabine uplift eastward to the southwestern corner of Alabama the $Mg+Ca/Na+K$ ratio in the middle Claiborne aquifer generally ranges from 1 to 2 in the outcrop except in northeastern Alabama and southeastern Missouri where it ranges from 5 to greater than 10. From the outcrop to midbay the ratio decreases to about 0.10 in most of the area. It then increases near the downdip limit of the data in southeastern Louisiana and in southeastern Alabama. From the Sabine uplift southward to the San Marcos arch the $Mg+Ca/Na+K$ ratio generally ranges from 0.50 to 2 in the outcrop area and decreases to less than 0.10 near the downdip limit of the data. From the San Marcos arch southward to the Rio Grande the $Mg+Ca/Na+K$ ratio ranges from about 0.50 to greater than 1 in the outcrop area and decreases to less than 0.10 along the downdip limit of the data.

Bicarbonate to Sulfate

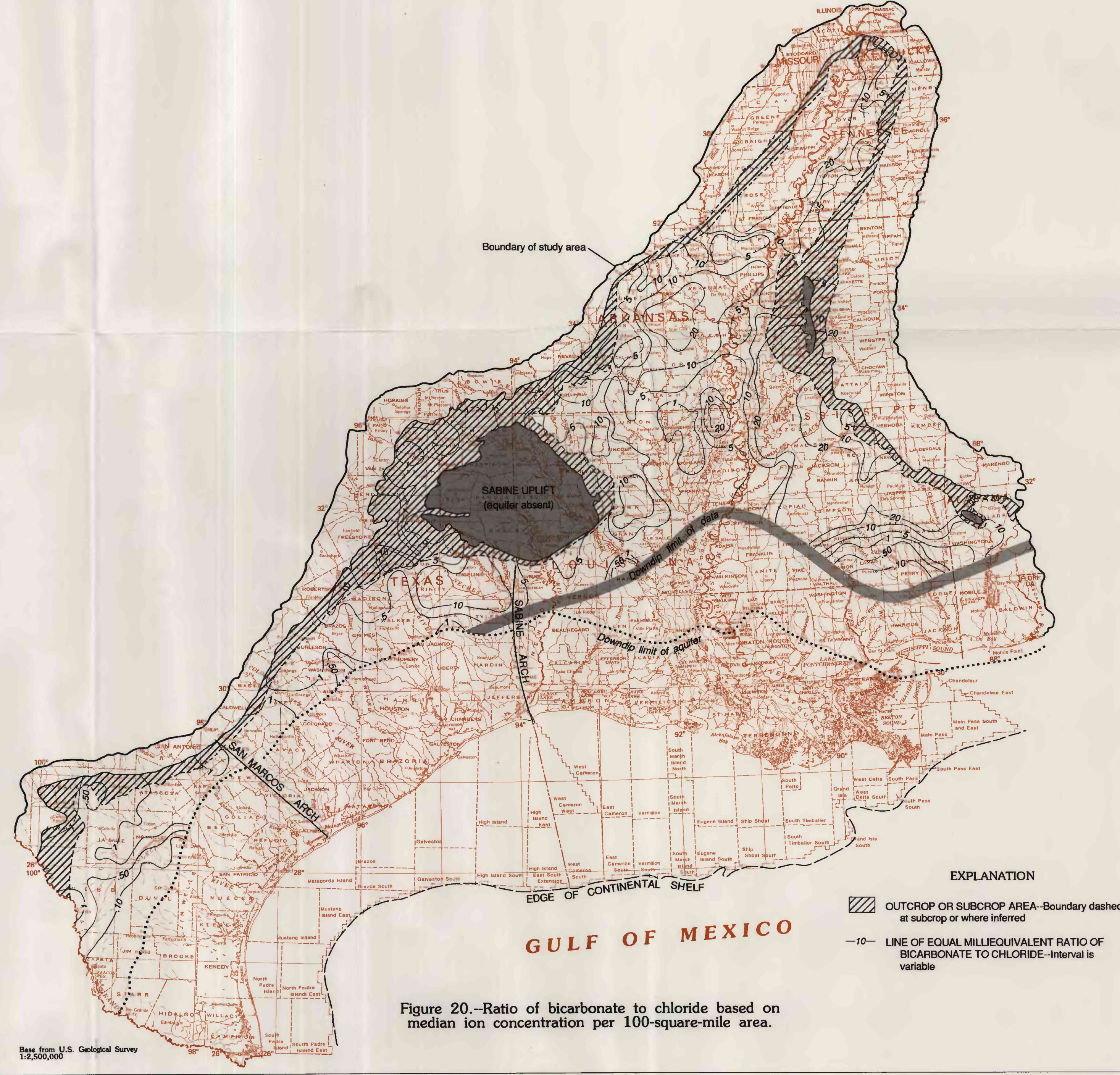
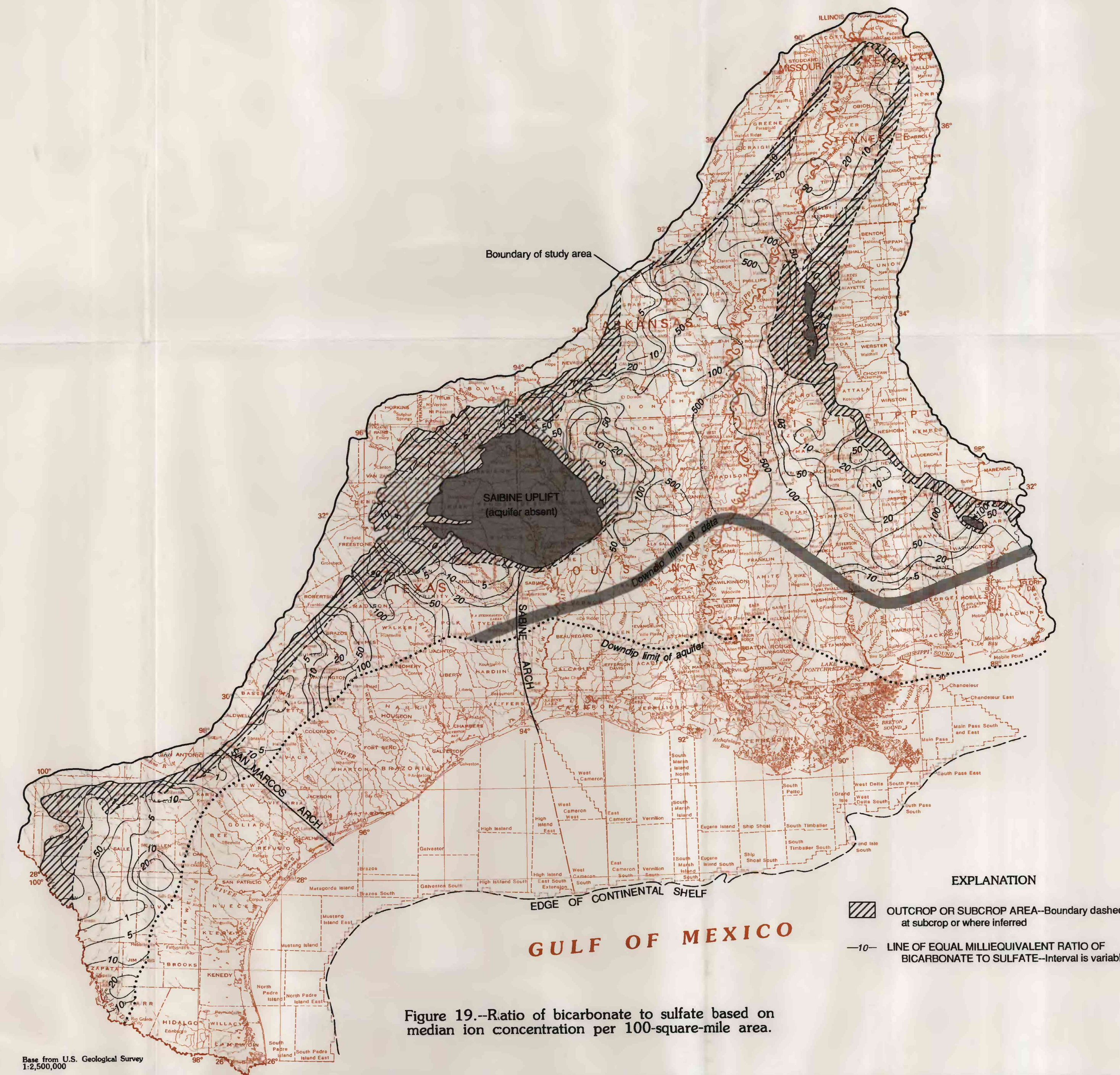
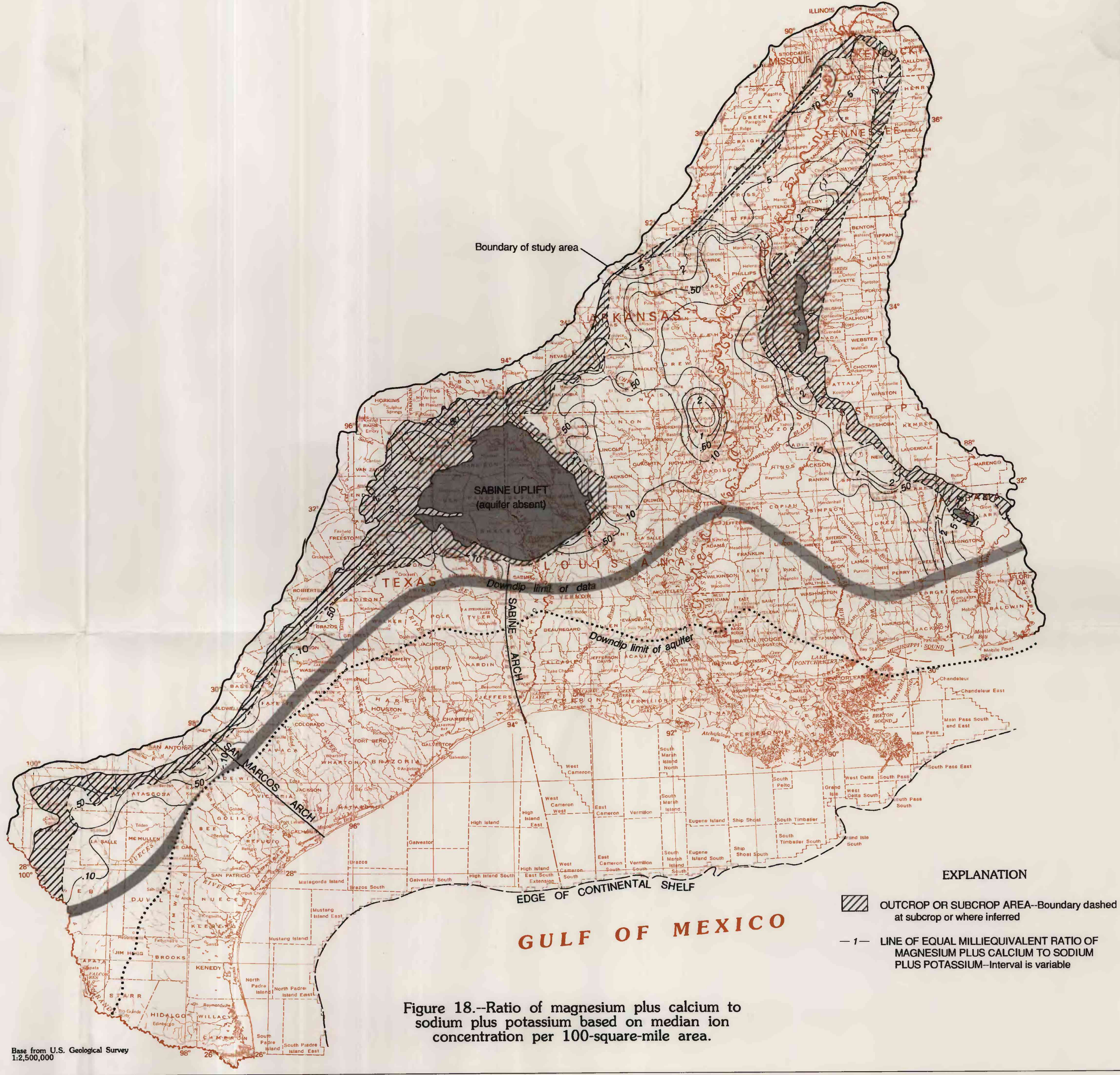
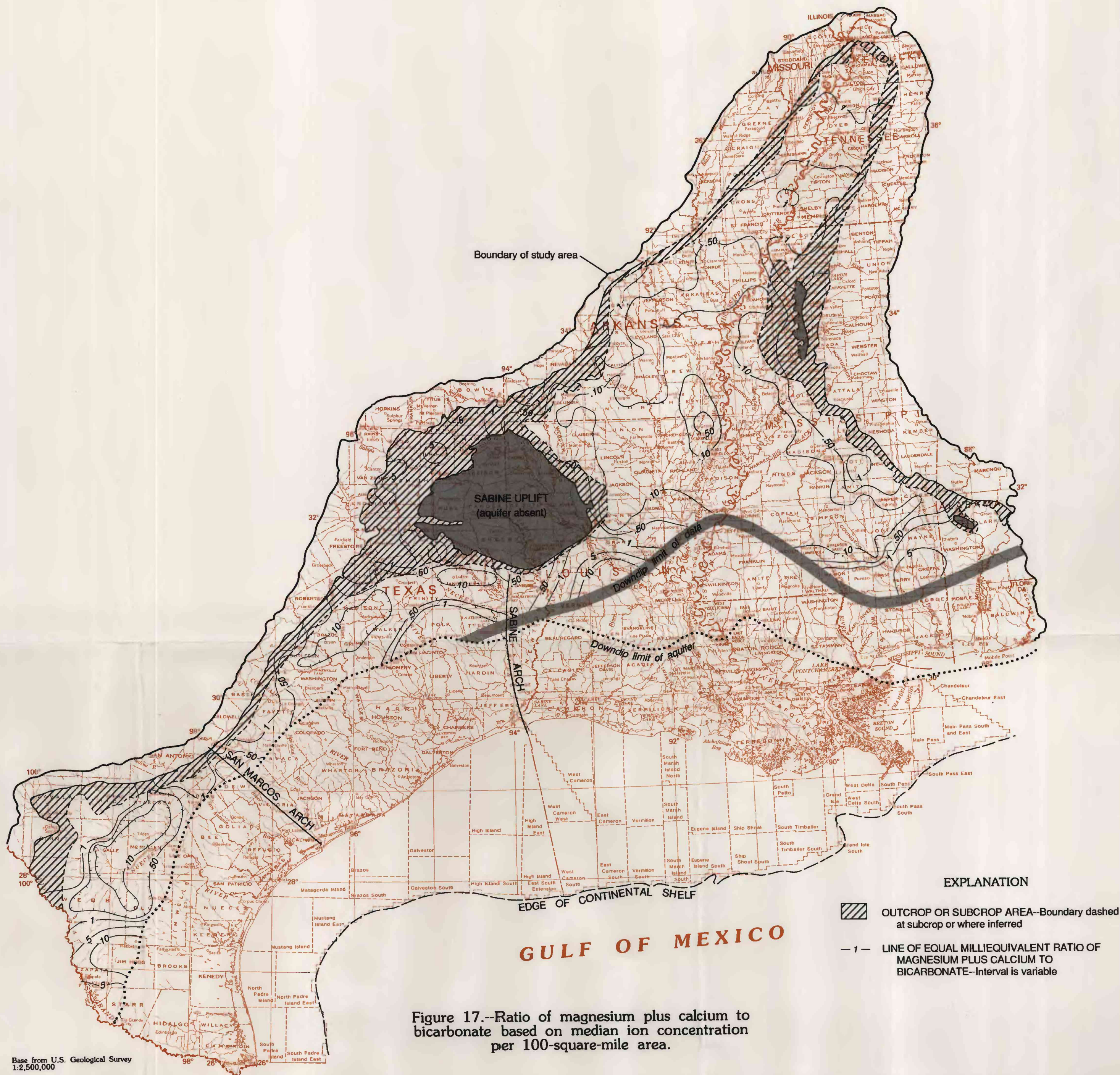
The areal distribution of the milliequivalent ratio of bicarbonate to sulfate (HCO_3/SO_4) in water from the middle Claiborne aquifer shows that the ratio ranges from 0.05 to 2460 (table 1). The HCO_3/SO_4 ratio in the area of the Mississippi embayment aquifer system appears to increase from the outcrop area toward the Mississippi River and from the northern part of the Mississippi embayment aquifer system to the southern part except in southeastern Mississippi and southwestern Alabama where it generally decreases from outcrop to the downdip limit of the data (fig. 19). West of the Sabine uplift there is an apparent trend in the HCO_3/SO_4 ratio except west of the San Marcos arch where the ratio appears to increase from the outcrop to the downdip limit of the data.

From the Sabine uplift eastward to the southwestern corner of Alabama the HCO_3/SO_4 ratio in the middle Claiborne aquifer generally ranges from 5 to 100 in the outcrop area and increases to more than 500 along the Mississippi River in northeastern Louisiana and southwestern Mississippi. Wherein in southern Mississippi and southwestern Alabama the ratio ranges from less than 5 to the downdip limit of the data so more than 10 along the outcrop. From the Sabine uplift southward to the San Marcos arch the HCO_3/SO_4 ratio ranges from about 1 to more than 100 in both the outcrop and in the area between the outcrop and the downdip limit of the data. From the San Marcos arch southward to the Rio Grande the HCO_3/SO_4 ratio ranges from about 0.50 to 10 in the outcrop area and increases to more than 20 near the downdip limit of the data.

Bicarbonate to Chloride

The areal distribution of the milliequivalent ratio of bicarbonate to chloride (HCO_3/Cl) in water from the middle Claiborne aquifer shows that the ratio ranges from less than 0.01 to 101 (table 1). The only apparent trend in the HCO_3/Cl ratio occurs in southeastern Mississippi and southwestern Alabama where it decreases from midbay to the downdip limit of the data and in the area southwest of the San Marcos arch where it decreases from the outcrop to the downdip limit of the aquifer (fig. 20).

From the Sabine uplift eastward to the southwestern corner of Alabama the HCO_3/Cl ratio in the middle Claiborne aquifer ranges from about 1 to more than 20 in the outcrop area and in most of the area between the outcrop and the downdip limit of the data. The exception is an area in southeastern Mississippi and southwestern Alabama where the ratio decreases from about 20 near midbay to less than 0.10 at the downdip limit of the data. From the Sabine uplift southward to the San Marcos arch the HCO_3/Cl ratio ranges from less than 1 to more than 10 in both the outcrop area and the area between the outcrop and the downdip limit of the data. From the San Marcos arch southward to the Rio Grande the HCO_3/Cl ratio decreases from more than 1 along outcrop area to less than 0.10 along the downdip limit of the aquifer in southern Texas.



PROPERTIES AND CHEMICAL CONSTITUENTS IN GROUND WATER FROM THE MIDDLE CLAIBORNE AQUIFER,
GULF COAST REGIONAL AQUIFER SYSTEMS, SOUTH-CENTRAL UNITED STATES

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