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Open File Report 10

Geology of Sarasota County, Florida

by

Kenneth M. Campbell

Florida Geological Survey
Tallahassee, Florida
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Physiography

Several authors have discussed the physiography of the Florida peninsula. For the purposes of this report, White's (1970) classification will be utilized. The vast majority of Sarasota County lies within the Gulf Coastal Lowlands. Two small areas in the northeast portion of the county fall within the boundaries of the DeSoto Plain. Barrier islands and lagoons are developed along most of the county's gulf coast.

Elevations within the county range from mean sea level along the gulf coast and the lower Myakka River to a maximum of approximately 100 feet in the extreme northeast portion of the county (immediately south of Verna). Elevations increase almost imperceptably from the west and southwest toward the northeast. The topography tends to be flat, with relatively steeper slopes in the vicinity of streams (Lane, 1973).

Gulf Coastal Lowlands

The prominant topographic features of the Gulf Coastal Lowlands within Sarasota County are scarps and terraces developed during Pleistocene sea level stands. Healy (1975a) shows four terraces within Sarasota County. The Pamlico

terrace is found at elevations of approximately 8-25 feet above mean sea level, the Talbot at 25-42 feet, the Penholloway at 42-70 feet and the Wicomico at 70-100 feet. The scarps which separate these terraces are, for the most part, poorly defined.

With the exception of the coast at Venice, the Sarasota County gulf coast consists of barrier islands, spits and lagoons. These barrier islands were formed during the last 4000 to 5000 years, since sea level became reasonably stable. The barrier islands seen today represent the latest adjustment to changing conditions during this period of time. Barrier islands change size, shape and position in response to both short-term and long-term conditions. Barrier islands can be "welded" together, split into segments, become attached to the mainland or even disappear completely. The method of formation and the original location may be obscured.

Barrier islands require an abundant sand supply. Since present sea level has stabilized there has been very little new sand being added to the barrier islands in this area. The result is that portions of these barrier islands are being eroded. Most of the sand lost to erosion is being redeposited as spits at the ends of the barrier islands, in the lagoons or offshore.

DeSoto Plain

The DeSoto Plain is a very flat area located primarily in Manatee, Hardee, DeSoto, Highlands, Glades and Charlotte counties. Only a small portion of the DeSoto Plain extends into the northeast corner of Sarasota County. That portion of the DeSoto Plain present in Sarasota County consists primarily of the

relatively steeper slope between the very edge of the plain and the inland edge of the Gulf Coastal Lowlands. White (1970) believes that the DeSoto Plain is a submarine plain probably formed under Wicomico seas (70 - 100 feet above present sea level).

DRAINAGE

The majority of Sarasota County is poorly drained. Many swamps, marshes, and ponds are present throughout the county. The Myakka River and its tributaries are the major streams in the county, although there are numerous small streams. Healy (1975b) shows the majority of Sarasota County as an area of artesian flow. The ground water table is at or near the land surface throughout much of the county. Natural drainage systems have been channelized and extensive ditch systems constructed to improve drainage.

STRATIGRAPHY

Surface and near surface sediments in Sarasota County consist of quartz sand, consolidated and unconsolidated shell beds, clays, limestone and dolomite. These sediments range in age from Oligocene (38-22.5 million years ago) to Holocene (10,000 years ago to present).

Oligocene Series

Suwannee Limestone

The Suwannee Limestone is present throughout Sarasota County in the subsurface. It is generally broken down into two units.

The upper unit of the Suwannee Limestone is a creamy white to light yellowish grey limestone containing darker dolomitized zones (Lane, 1973). The undolomitized portions are variably packstone to wackestone, poorly to well indurated and variably recrystallized. The upper unit is highly fossiliferous, containing abundant poorly preserved foraminifera, molluscs, echinoids and corals. Moldic and vuggy porosity is common.

The lower unit of the Suwannee Limestone is generally a pale grey to light yellow calcilutitic limestone. The lower unit is typically softer, more calcilutitic, and less porous and fossiliferous than the upper unit and may contain finely divided pyrite (Lane, 1973).

The top of the Suwannee Limestone is encountered at approximately 350 feet below mean sea level in the northeastern-most part of the county and dips to the south and west. In the southern-most part of the county, the top of the Suwannee Limestone is encountered at depths of approximately 650 feet below mean sea level.

The thickness of the Suwannee ranges from approximately 150 feet to over 350 feet. The thinnest portion is in extreme southwestern Sarasota County while the thickest portions are in the vicinity of Sarasota and in the eastern portion of the county (Lane, 1973).

Miocene Series

Hawthorn Group

Scott (1985) has raised the Hawthorn from formation status to group status. The Hawthorn Group will include those sediments which in the past have been included in the Tampa, Hawthorn and Bone Valley formations. In Sarasota County, the Hawthorn Group consists of the Arcadia Formation which is overlain by the Peace River Formation.

Arcadia Formation

The Arcadia Formation (Scott, 1985) in Sarasota County consists of, in ascending order, the Tampa Member and an unnamed upper member. The Tampa Member overlies the Suwannee Limestone and is lithologically similar to the type Tampa Formation of King and Wright (1979) but has a slightly greater phosphate content (1-3 percent) and greater areal limits (Scott, 1985). The Tampa Member is a white to tan-colored, quartz sandy limestone with a carbonate mud matrix. Varying amounts of clay are usually disseminated throughout the rock (King and Wright, 1979, Scott, 1985). Some beds within the Tampa Member contain more than 50 percent quartz sand. Dolomite is relatively uncommon within the Tampa Member (King and Wright, 1979; Scott, 1985). The Tampa Member is recognizable throughout most of northern Sarasota County, however the unit becomes indistinct due to a facies change in southern Sarasota County.

The upper (unnamed) member of the Arcadia Formation includes those sediments which in the past have been referred to as the "Hawthorn carbonate unit" (Scott, 1985). Lithologically, these sediments consist of white to yellowish-grey,

quartz sandy, phosphatic, sometimes clayey, dolomites and limestones (uncommon). Occasional beds of carbonate rich quartz sand and thin clay beds are present.

The Arcadia Formation is present throughout Sarasota County in the subsurface. The top of the Arcadia Formation is encountered at approximately mean sea level in northeastern Sarasota County to just over 100 feet below mean sea level in the southern-most part of the county. The Arcadia dips gently to the south-southeast. The thickness of the Arcadia ranges from approximately 300 feet to over 500 feet. The thickness increases from the northeast and east to the west, southwest and south (Scott, 1985).

Peace River Formation

The Peace River Formation (Scott, 1985) in Sarasota County consists of those sediments which have been described as "upper Hawthorn clastics." Lithologically, these sediments consist of yellowish-grey to light olive green interbedded phosphatic sands, clayey sands, clays and dolomite stringers. The Peace River is present throughout the county, with the exception of the immediate area of Sarasota.

The top of the Peace River Formation is found at or near mean sea level ($\pm$ 30 feet) throughout much of the county (Scott, 1985). In northeastern Sarasota County, however, the Peace River is encountered at 50 feet above mean sea level.

The thickness of the Peace River ranges from zero in the vicinity of Sarasota to 110 feet in the eastern-most part of the county. The formation thickness to the east and south (Scott, 1985).

Anastasia Formation

The Anastasia Formation (probably late Pleistocene age) is present at "Point of Rocks", Siesta Key. The Anastasia forms a prominent outcrop which extends along the beach for about 1 mile. The outcrop consists of casehardened, bedded coquina composed primarily of mollusc shells and fragments (Lane, 1973). Wave action erodes and undercuts this material into large slabs. The resistance to wave erosion of this material accounts for the prominant seaward projection of the coastline at this point.

Holocene Series

Deposits of Holocene age (10,000 years ago to present) are primarily limited to present day stream flood plains, beaches, intertidal swamps and marshes, inland swamps, marshes and lakes. These sediments consist of sand, silt, clay and organic materials.

Pliocene-Pleistocene Series

Undifferentiated Surficial Sands and Shell

Surficial deposits of Pliocene-Pleistocene age (5.3 to .01 million years ago) blanket the county. Throughout the majority of the county, the surficial deposits consist of sandy, silty and clayey, variably indurated shell beds overlain by a thin veneer of clean quartz sand. The thickness of these deposits is typically 15-30 feet. The shell beds are not present in the eastern and western portions of the northern third of the county (Lane, 1973). The shell beds generally are 5-6 feet thick, but range from 2-15 feet thick (Lane, 1973) and are often iron stained. Iron cemented hardpan is common.

Clean quartz sand of Pleistocene age (1.6 to .01 million years ago) forms a veneer over the shell beds or the Peace River Formation where the shell beds are absent. These deposits consist of unconsolidated very fine to medium grained (1/16-1/2 mm) quartz sand. The sands are white to light brown in color and contain trace amounts of phosphate sand and limestone or shell fragments.

The clean quartz sands were deposited by Pleistocene seas at various sea levels. The scarps and terraces discussed under Physiography are developed in these sands. The maximum thickness of surficial sands is 45-50 feet in the vicinity of Verna.

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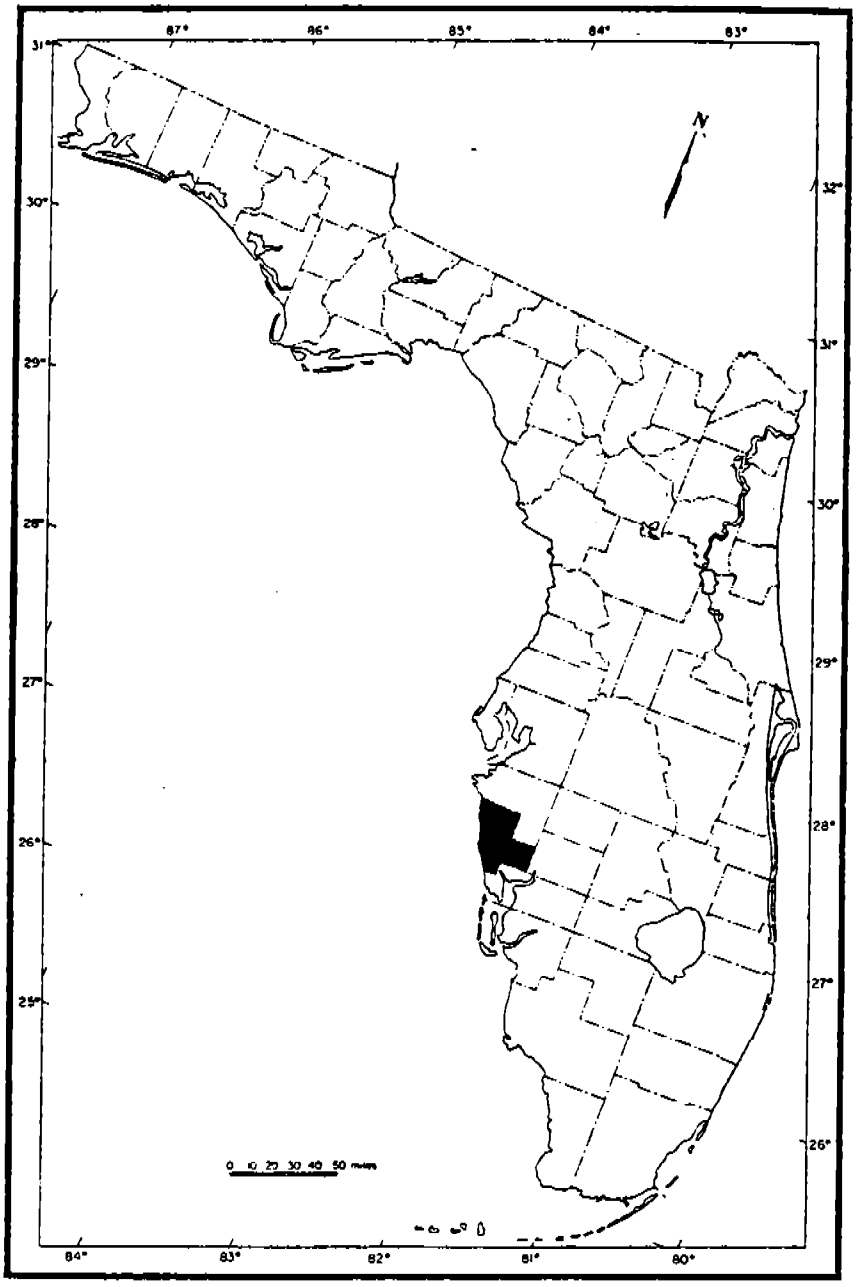
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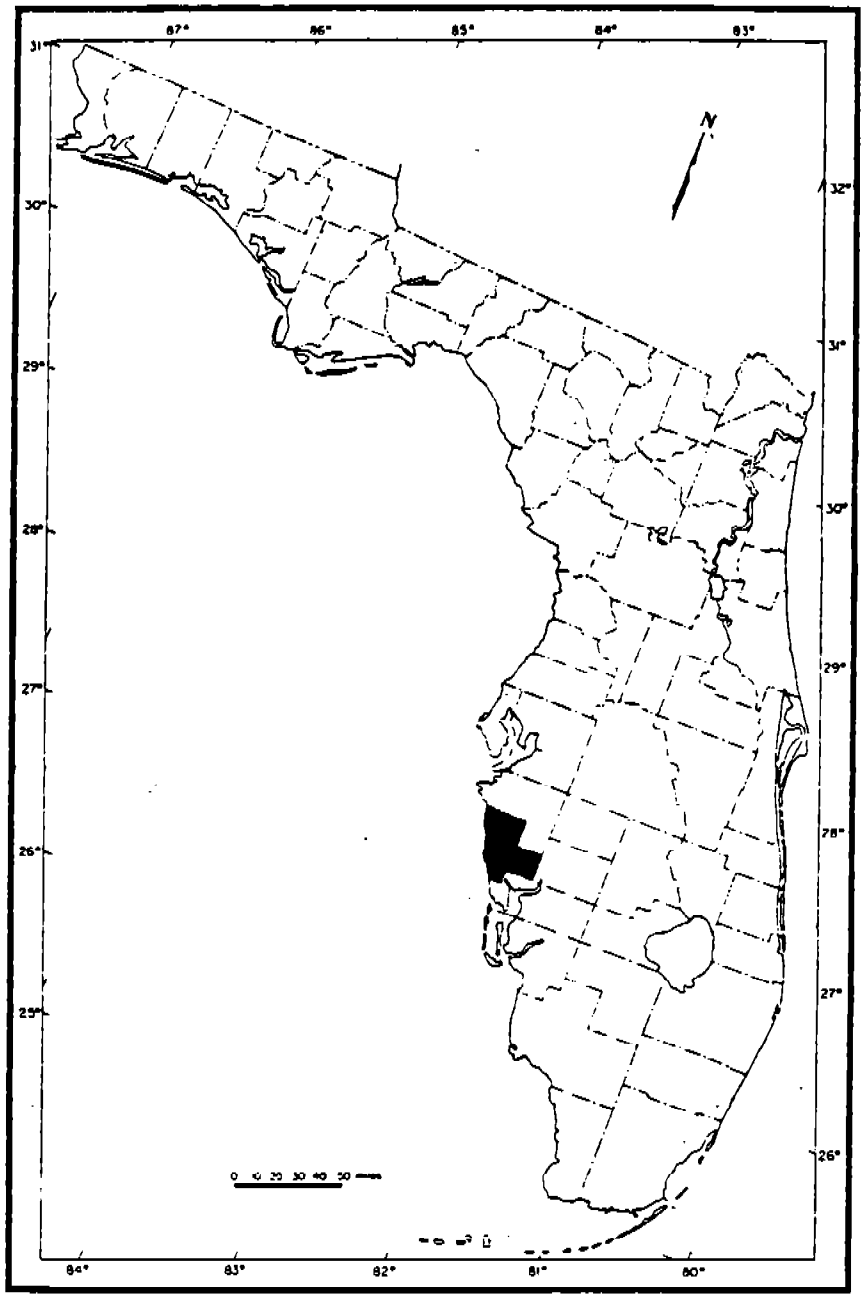
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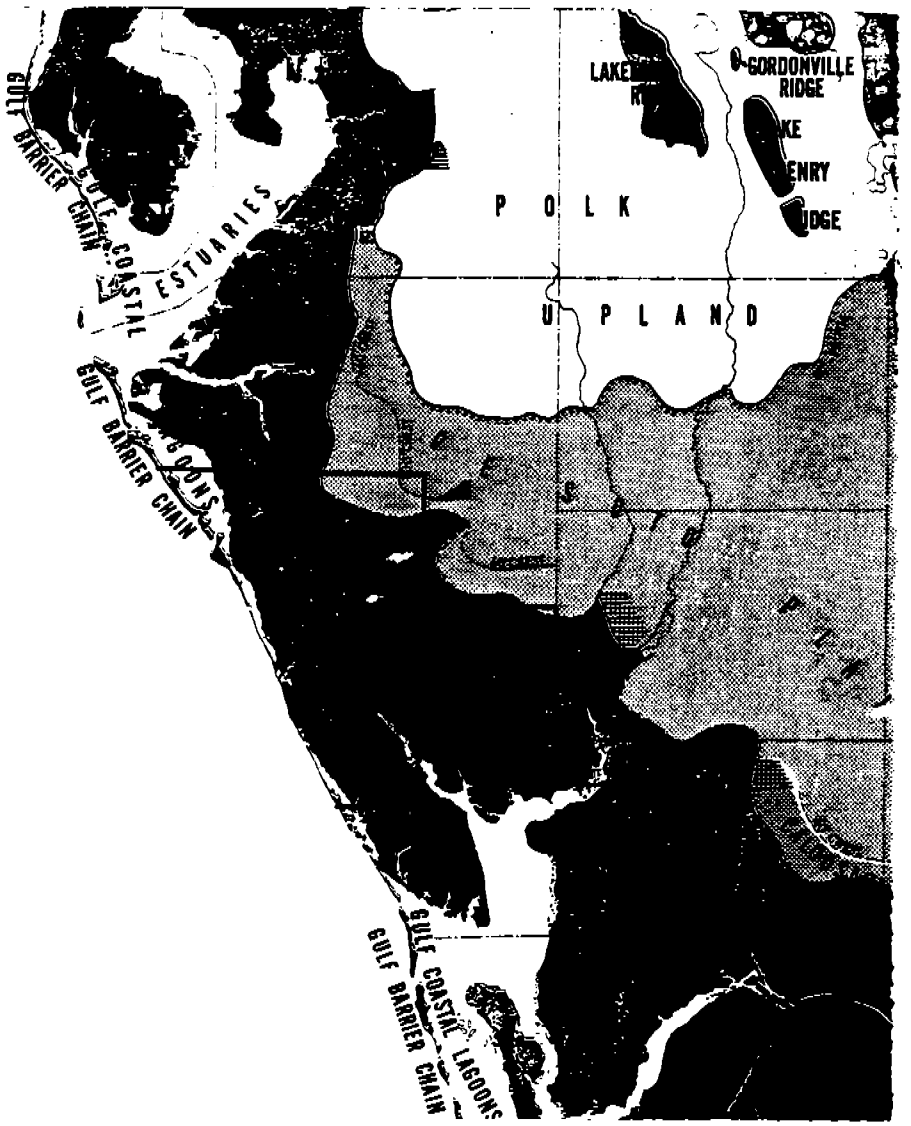
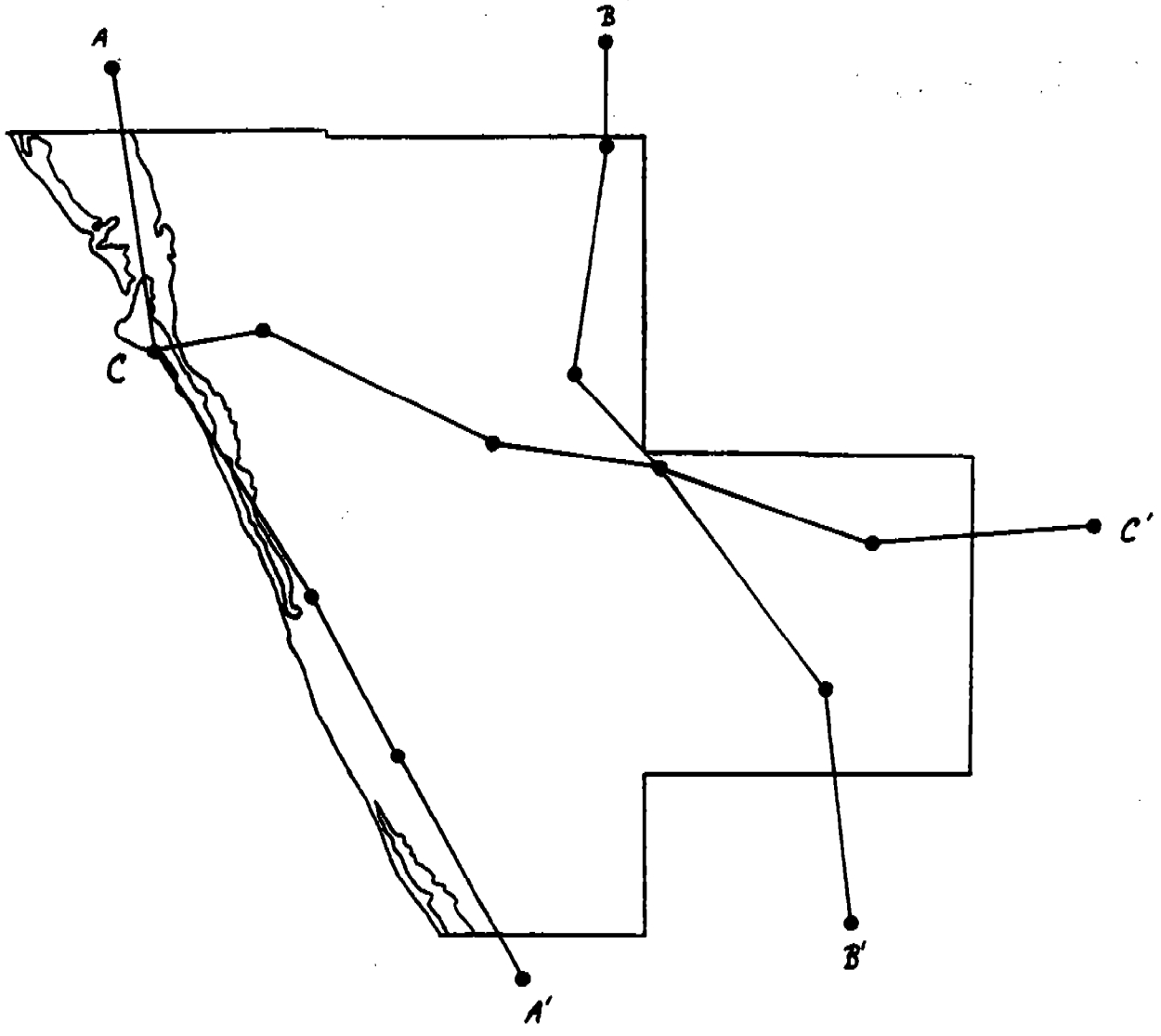


PHYSIOGRAPHIC MAP SARASOTA COUNTY AND SURROUNDING REGION, FROM White, 1970.

CROSS SECTION LOCATION MAP

SARASOTA COUNTY



CROSS SECTION LOCATION MAP

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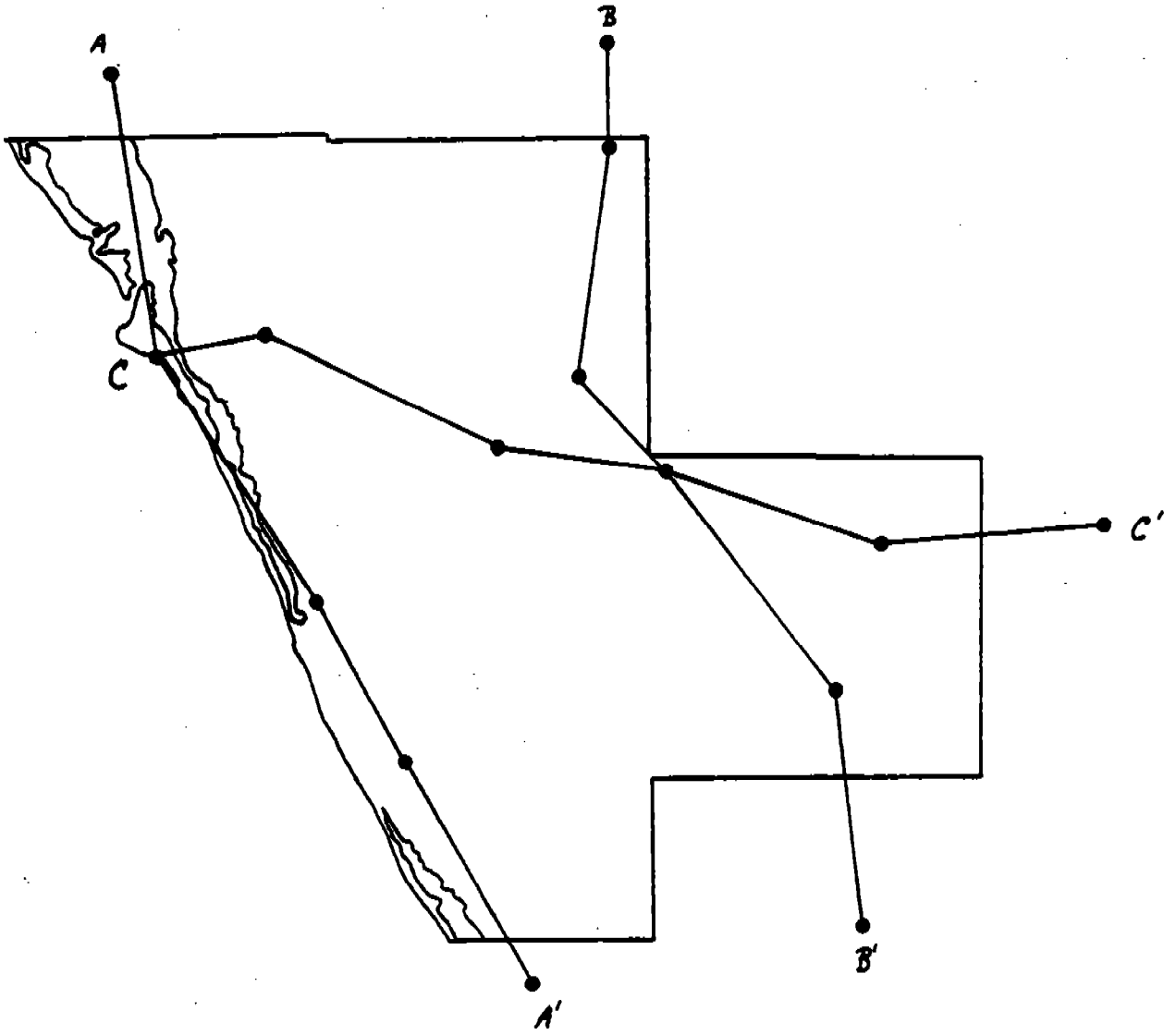

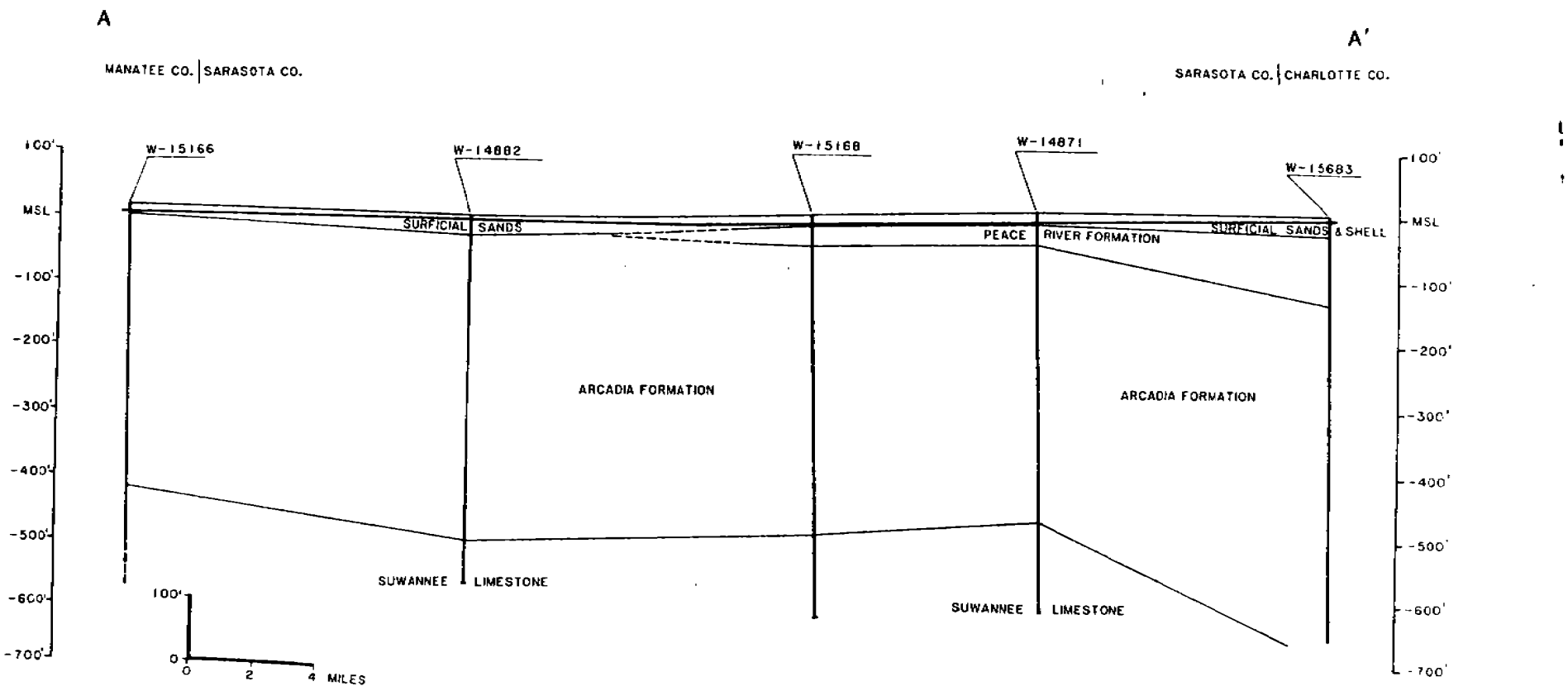
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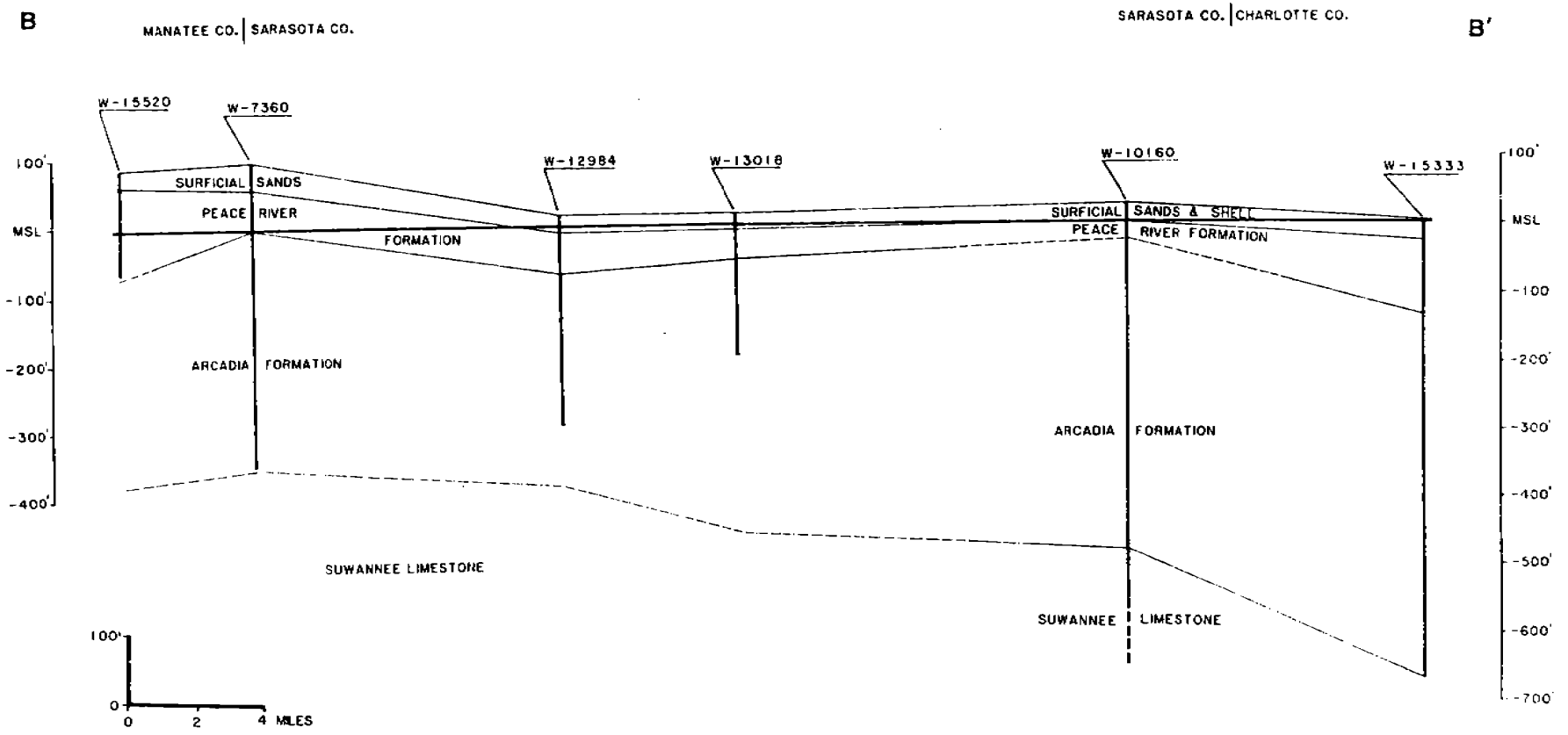
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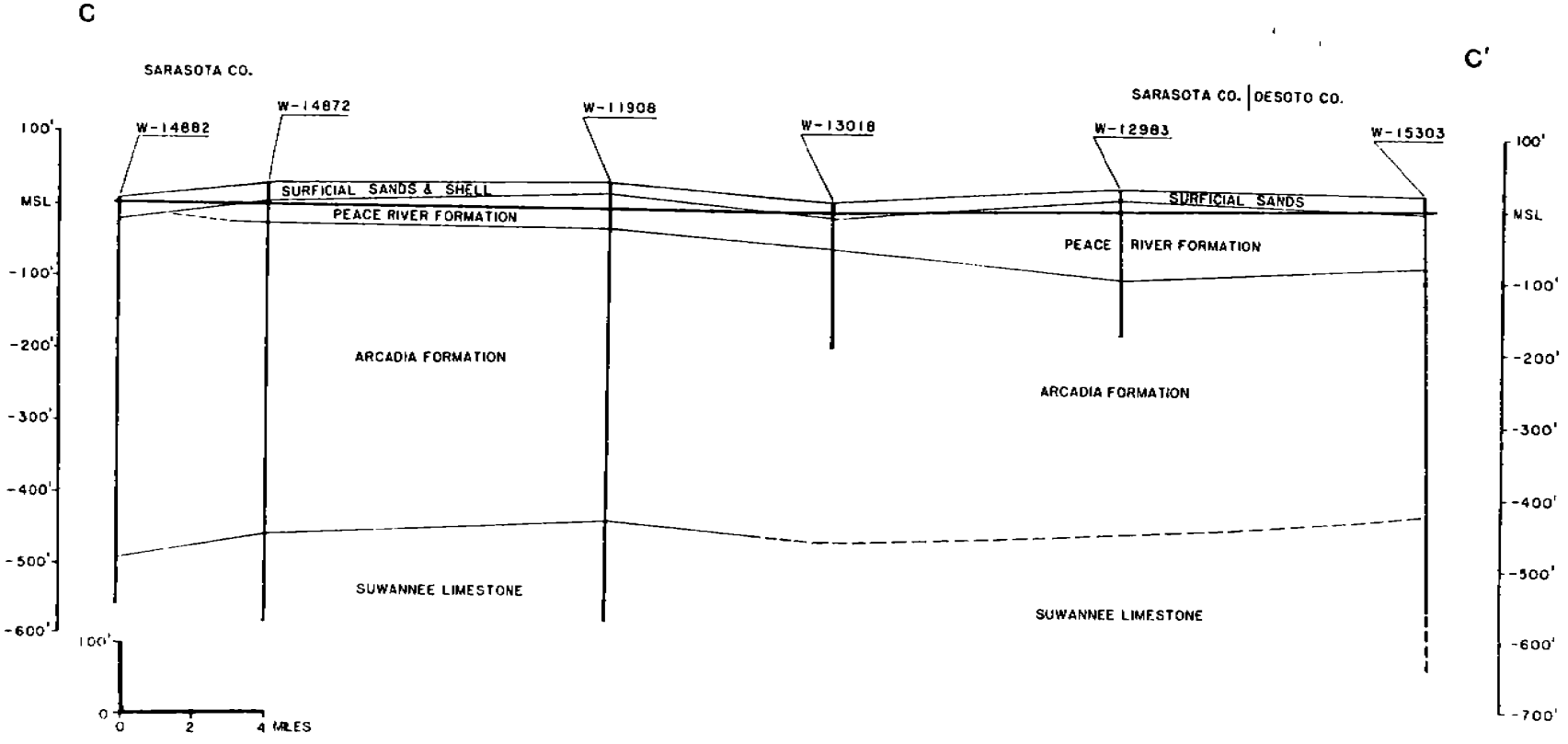
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