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BEDROCK GEOLOGY OF THE WESTERN PORTION OF THE U.S.G.S. 1:100,000 SCALE HOMESTEAD QUADRANGLE

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Southeastern Florida's landscape exhibits extremely low relief. Maximum elevations within the area of the Homestead quadrangle rarely exceed 3.5 meters, and much of the area lies below 1.5 meters. The highest elevations occur on the Atlantic Coastal Ridge (Hoffmeister et al., 1967). The land surface slopes gently away from the Atlantic Coastal Ridge toward the Everglades, the Gulf of Mexico, the Atlantic Ocean and Florida Bay. The geomorphic features recognized within the map area include the Everglades, the Southern Slope, the Reticulated Coastal Swamps, the Gulf Coastal Lagoons and Florida Bay (White, 1970). Within the map area, the land–surface slope is almost imperceptible, appearing nearly flat for kilometers.

The bedrock geology of the western portion of the Homestead quadrangle consists entirely of late Pleistocene Miami Limestone, a marine carbonate. The Miami Limestone underlies the entire mainland portion and Florida Bay within the map area. It is often covered by a veneer of marl, muck, and peat. In the northwestern–most part of the map area, where the Miami Limestone thins, the Pliocene Tamiami Formation may be exposed below water level in streams and rivers.

Carbonate sediments of the Miami Limestone occur within a few meters of the surface throughout the map area. Limestone is exposed in the Pinelands, in the northeastern portion of the map area, and may be more than three meters below land surface at the coast. The carbonate sediments have been extensively affected by limestone dissolution, creating a micro–karstic landscape in the areas where the Miami Limestone is at the surface or covered by a thin sediment layer. The dissolutional holes in the limestones, which are commonly filled with water, accumulate organic matter and marl. The karstified surface typically displays up to one meter of relief. The micro–karstic surface is frequently exposed in areas mapped as Miami Limestone with thin soils, as shown on the Surficial Sediments Map. This irregular surface probably underlies the entire map area, though it is generally masked by surficial sediments and soil.

The deepest cores examined for this investigation penetrated over 50 meters of Neogene and Quaternary sediments. The majority of the cores penetrated less than 20 meters of the stratigraphic section. The oldest units encountered were the Pliocene Tamiami Formation and the laterally equivalent portion of an unnamed Pliocene siliciclastic unit. The Pleistocene Fort Thompson Formation disconformably overlies the Tamiami Formation except where the Fort Thompson is absent and the Miami Limestone lies disconformably on the Tamiami. The Fort Thompson Formation is disconformably to conformably overlain by the Pleistocene Miami Limestone. The base of the Miami Limestone and the top of the Fort Thompson Formation may be time equivalent. Holocene marls, mucks, and peats often overlie the Miami Limestone within the map area. The relationships of these stratigraphic units can be seen on cross sections A–A' through C–C' accompanying the maps.

The Tamiami Formation, as recognized in this area, consists of very fine to medium–grained, variably silty and clayey, unconsolidated to poorly consolidated, variably fossiliferous quartz sand. Minor amounts of coarse quartz sand were encountered. A moderately to well indurated, variably sandy limestone (wackestone to packstone) frequently lies on top of the sand facies and is included in the Tamiami Formation. The Tamiami Formation appears to grade laterally and downward into an unnamed Pliocene siliciclastic unit. The siliciclastic unit is not separated from the Tamiami Formation in this study since the cores did not penetrate deep enough to properly identify the formational break.

The Fort Thompson Formation disconformably overlies the Tamiami Formation in the map area. The Fort Thompson Formation consists of variably sandy (quartz), molluscan–moldic limestone (mudstone to packstone). There is a thin limestone (mudstone to wackestone) unit present near the top of the Fort Thompson in many of the cores investigated for this study. This limestone is of freshwater origin. The carbonate sediments above the Tamiami Formation limestone and below the Miami Limestone are placed in the Fort Thompson Formation following the convention of previous authors (see Causaras, 1986). By following this convention, sediments that may contain a Caloosahatchee and/or Bermont fauna are placed in the Fort Thompson Formation. The Fort Thompson Formation thins to the northwest within the study area and is absent in the northwestern–most portion of the Homestead quadrangle.

The Miami Limestone varies from a wackestone to a grainstone and is composed of pellets, skeletal grains, ooids and carbonate mud with a variable, but generally minor, quartz sand component. The Miami Limestone is variably fossiliferous containing mollusks, bryozoans, foraminifera, and corals. Often the fossils have been dissolved, creating a very permeable limestone which comprises the Biscayne aquifer of the surficial aquifer system. Induration varies from poor to good and the limestones are frequently highly recrystallized. Hoffmeister et al., (1967) recognized two distinct facies within the Miami Limestone – an oolitic facies and a bryozoan facies. Johnson (1992) recognized six facies within the Miami Limestone ranging from an ooid calcarenite to a microsparry–coralline limestone. Based on the available data, the Miami Limestone was not subdivided, and was mapped as a single lithostratigraphic unit for this study.

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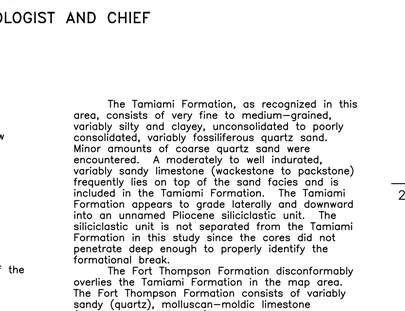
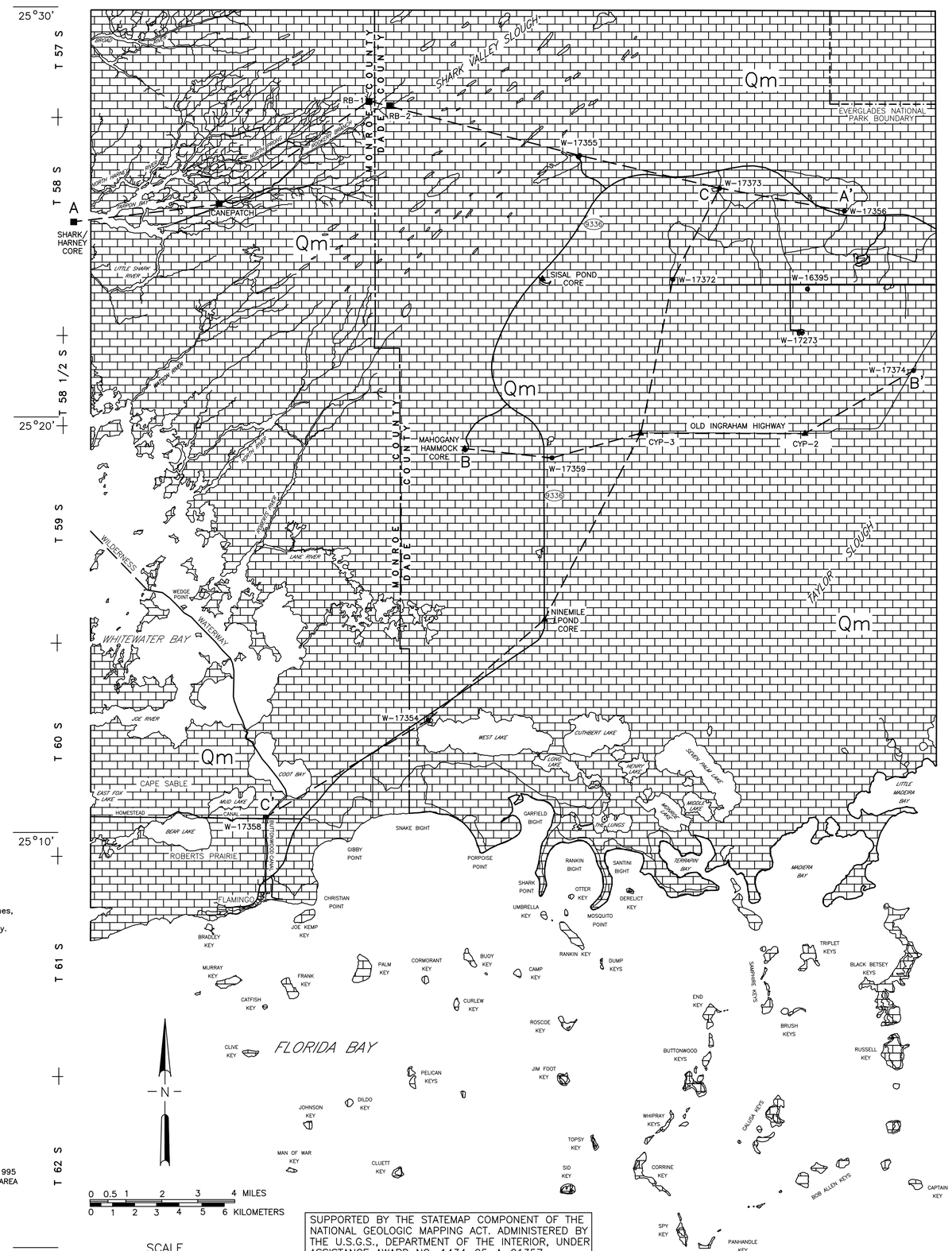
Selected Bibliography
(See Surficial Sediments Map)





EXPLANATION

- Qm — MIAMI LIMESTONE
- BOUNDARY OF EVERGLADES NATIONAL PARK
- A – – – A' — CROSS–SECTION LOCATION
- ▲ CORE/CUTTINGS (USGS/SFWMD)
- ● FGS CORE
- ■ USGS CORE

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