FLORIDA GEOLOGICAL SURVEY
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BEDROCK GEOLOGY OF THE EASTERN PORTION OF THE U.S.G.S. 1:100,000 SCALE HOMESTEAD QUADRANGLE

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The terrain of southeastern Florida exhibits extremely low relief. The maximum elevations in the area of the Homestead quadrangle rarely exceed 3.5 meters, with much of the area having elevations of less than 1.5 meters. The highest elevations occur on the Atlantic Coastal Ridge (Hoffmeister, et al., 1967), and on Key Largo. The land surface slopes gently away from the Atlantic Coastal Ridge toward the Everglades, the Atlantic Ocean, and Florida Bay. Within the Everglades, the slope of the land surface is imperceptible, appearing flat for miles.

The Miami and Key Largo Limestones are often covered by a thin overburden of marl, muck and peat. For the purpose of this map, these sediments have been removed to reveal the bedrock (See the accompanying Surficial Sediments Map).

The bedrock geology of the eastern portion of the Homestead quadrangle consists of two late Pleistocene, marine carbonate formations – the Miami Limestone and the Key Largo Limestone. The Miami Limestone covers the mainland portion of the map area, the southeastern terminus of the Florida peninsula. The Key Largo Limestone forms the present day Florida keys in the study area. The bedrock geology of Florida Bay and the mud banks is mapped as Miami Limestone (Shinn, pers. comm., 1995); however, the southeastern boundary of the Miami Limestone is approximate.

Carbonate sediments of the Miami and Key Largo Limestones occur at or within 2.5 meters of the surface throughout the map area. The carbonate sediments have been affected by dissolution, creating a micro–karstic landscape in those areas where the Miami Limestone is at the surface or covered by a thin soil. The karst holes in the limestones accumulate organic matter and marl; these features are often water filled. Relief on this karstic surface can be more than one meter. The micro–karstic surface is often exposed in areas mapped as Miami Limestone with thin soils, as shown on the Surficial Sediments Map. The micro–karstic nature of the limestone probably extends under the entire map area, although this is masked by the surficial sediments.

The effects of dissolution are also very evident in the subsurface. Cores drilled for this study exhibit extensive dissolution of fossils and carbonate sediments, resulting in highly porous limestones. These limestones form the Biscayne aquifer of the surficial aquifer system.

For the purposes of this investigation, the upper 50 meters of the stratigraphic section were examined. The deepest unit encountered was the Pliocene Tamiami Formation; many of the deeper wells terminated in this unit. The Pleistocene Fort Thompson Formation lies disconformably suprajacent to the Tamiami Formation. The Pleistocene Miami and Key Largo Limestones both overlie the Fort Thompson Formation with an apparent disconformity. The base of the Miami and Key Largo Limestones may be laterally equivalent with the top of the Fort Thompson Formation. Holocene marls, muck and peat may overlie the Miami and Key Largo Limestones. The relationships of the stratigraphic units can be seen on cross sections A–A' through E–E' accompanying the maps.

The Tamiami Formation, as recognized in this area, consists of very fine to medium grained, variable silty and clayey quartz sand. The sand is variably fossiliferous (molluscs) ranging from unfossiliferous to abundantly fossiliferous. Lithification varies from unindurated to well indurated.

The Fort Thompson Formation overlies the Tamiami Formation disconformably. The Fort Thompson Formation consists of variable sandy (quartz), molluscan–moldic limestone. The entire carbonate section between the Tamiami Formation and the Miami and Key Largo Limestones is referred to as the Fort Thompson Formation, following the convention of previous authors (see Causaras, 1986). By following the convention, the Caloosahatchee Formation and Bermont formation are not recognized. However, since mollusc molds suggest the presence within this section of Caloosahatchee fauna, Caloosahatchee deposition may have occurred and may be preserved in the limestone section.

The Miami Limestone is a grainstone to packstone composed of ooids, pellets, skeletal grains and carbonate mud with a variable, but generally minor, quartz sand component. Induration varies from poor to good and the limestones are often recrystallized. Hoffmeister et al., (1967) recognized two distinct facies of the Miami Limestone, an oolitic facies and a bryozoan facies. Johnson (1992) interpreted the Miami Limestone as having six facies ranging from an ooid calcarenite to a microsparry–coralline limestone. Field investigations and sampling did not provide sufficient information to properly subdivide the Miami Limestone in the present study area. Therefore, the Miami Limestone is mapped as a single entity.

The Key Largo Limestone is a coralline limestone composed of abundant specimens of small to large reef–forming corals, with the areas between the corals filled by reefal debris and numerous whole and fragmented fossils. The Key Largo Limestone occurs in a narrow band extending the length of the Keys, as shown on the Homestead quadrangle Surficial Sediments Map.

Bibliography

(See Surficial Sediments Map)

EXPLANATION

- Qm — MIAMI LIMESTONE (SOUTHEASTERN BOUNDARY APPROXIMATE)
- Qk — KEY LARGO LIMESTONE
- DISTURBED (BY HUMAN ACTIVITY)
- BOUNDARY OF EVERGLADES NATIONAL PARK
- A – – – A' — CROSS–SECTION LOCATION
- · W–# — F.G.S. WELL NUMBER
- · G–# — U.S.G.S. WELL NUMBER
- ⚒ — QUARRY

1995/1996 STUDY AREA
1994/1995 STUDY AREA (THIS MAP)
1:100,000 SCALE HOMESTEAD QUADRANGLE

SCALE
0 0.5 1 2 3 4 MILES
0 1 2 3 4 5 6 KILOMETERS

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