Map Unit Properties Table

Age	Map Unit (Symbol)	Unit Description	Erosion Resistance	Suitability for Development	Hazards	Paleontologic Resources	Cultural Resources	Mineral Specimens	Mineral Resources	Habitat	Recreation	Global Significance
HOLOCENE	**Benthic Habitat:** Land (l); Reef/Hardbottom, seagrass (rh)	Mapping based on aerial photography, land indicates subaerial units (described below); rh indicates units mostly devoid of deep sediments or subaqueous vegetation	Variable	Development of Florida Bay is not advised	Boat landings and groundings possible for these units	See below surficial unit descriptions, modern fauna and shells	See below surficial unit descriptions, shipwrecks, and flooded artifacts and sites	None documented	None documented	Units support seagrass patches and coral reefs	Diving and boating	Hardbottom areas are enigmatic in Florida Bay, subject of restoration efforts
HOLOCENE	**Benthic Habitat:** Submersedaquatic vegetation SAV, Submersed rooted vascular plants SRV (srv); Continuous SRV (srvc); Continuous SRV, bank (srvcb); Continuous SRV, dense patches of SRV in matrix of continuous sparse SRV (srvcp); Continuous SRV, dense patches of SRV in matrix of continuous sparse SRV (srvcpb); Discontinuous SRV (srvd); Discontinuous SRV, bank (srvdb); Discontinuous SRV, dredged (srvdd)	Mapping of units based on aerial photography and ecological interpretation. Units vary based on degree of aquatic vegetation cover, rootedness of plants, and anthropogenic alterations	NA	Development of Florida Bay is not advised	Dredged areas have reduced visibility, boat groundings	None documented	None documented	None documented	None documented	Units support fisheries, cycle nutrients and stabilize sediments, mangrove, coral reef, and continental shelf ecological communities	Diving and boating	Subject of massive restoration efforts due to loss of seagrass beds, phytoplankton blooms and elevated turbidity
HOLOCENE	**Benthic Habitat:** Unknown benthic habitat (ubh); Unknown benthic habitat, dredged (ubhd); Unknown benthic habitat, streams (ubhs); Unknown benthic habitat, submersed tidal canals (ubhstc)	Areas uninterpretable beyond rudimentary observation	Underwater currents may easily remove	Development of Florida Bay is not advised	Dredged areas have reduced visibility, boat groundings	None documented	Sediments may contain artifacts and shipwrecks	None documented	None documented	Benthic habitat, undelineated	Diving and boating	Subject of massive restoration efforts due to loss of seagrass beds, phytoplankton blooms and elevated turbidity
HOLOCENE	**Benthic Habitat:** Unconsolidated sediments, mud (usm); Mud, bank (usmb); Unconsolidated sediments, mixed fine, bank (usmfb); Unconsolidated sediments, mixed fine, seagrass (usmfs)	Mapping of units based on aerial photography and ecological interpretation. Units vary based on sediment composition and degree of seagrass cover. All units are unconsolidated with thick muds and interlayered coarser sediments. Seagrass areas present in patches.	Underwater currents may easily remove	Development of Florida Bay is not advised	Elevated turbidity boat groundings	Modern fauna and carbonate shells	Sediments may contain artifacts and shipwrecks	None documented	Mud, clay	Units support seagrass patches, mangrove, coral reef areas, unconsolidated substrate supports burrowing species	Diving and boating	Subject of massive restoration efforts due to loss of seagrass beds, phytoplankton blooms and elevated turbidity
HOLOCENE	**Surficial:** Thin soil over Miami Limestone (sm); Thin soil over Key Largo Limestone (sk)	Sm is approximately 30 cm thick over irregular bedrock surface, mixed sediment. Sk is generally 15 to 30 cm deep with variations per bedrock expression.	Very low	Fine for most development, used for agriculture, susceptible to contamination	Unit is slippery when water saturated	None documented	Land use evolution studies, may contain Native American artifacts	None documented	Soil	Supports grasslands and agriculture	Fine for most recreation unless supporting fragile habitats	Soil development studies

Age	Map Unit (Symbol)	Unit Description	Erosion Resistance	Suitability for Development	Hazards	Paleontologic Resources	Cultural Resources	Mineral Specimens	Mineral Resources	Habitat	Recreation	Global Significance
HOLOCENE	**Surficial:** peat with marl (pm); Marl (ma); Marl underlain by peat (mp)	Freshwater carbonate marl varies in thickness (less than 30 cm to more than 1 m) grading laterally into mucks and marine carbonate muds and marls. Marl is generally buff colored to tan and fossiliferous. Some sand, silt, and clay are present locally in lenses. Mp is underlain by organic rich peat sediments at depths exceeding 30-60 cm.	Low	Fine for most development, structures are delicate, may be unstable for buildings and roads.	If present as a crust, unit may be a hazard for walking visitors	Plant debris, freshwater mollusks	May contain Native American settlement remains and artifacts	Freshwater marl	Peat	Supports freshwater mollusks and algae	Fine for most uses unless irregular surfaces are present or if water saturated, attractive to ORV use	Unusual freshwater marls coat plants
HOLOCENE	**Surficial:** Muck (mu); Carbonate mud (cm); Disturbed (d)	Muck contains varying percentages of organic matter, carbonate mud and marl, and other non-organic components including siliciclastics. Carbonate muds form islands and embankments, unit may exceed 2.5 – 3 m in thickness	Very low	Fine for most development, sedimentary structures are delicate, may be unstable for buildings and roads.	Unit is slippery and if deep enough, may prove hazardous to walk through when water saturated	Freshwater mollusks	None documented	None documented	None	Muck commonly supports mangroves. Carbonate mud supports mangroves and buttonwoods	Muck is unsuitable for most recreational use, attracts ORV use	Carbonate mud bank development and habitat
HOLOCENE	Holocene sediments (Oh)	Sediments include quartz sands, carbonate sands and muds, and organic material. Unit is generally less than 1.5 m thick near coastlines.	Very low	Fine for most development, unconsolidated nature of unit may prove unstable for roads and buildings.	If water saturated, unit is hazardous for visitor use due to slippery surfaces and deep muds	Freshwater mollusks, plant and root debris	May contain Native American settlement remains and artifacts, land use evolution studies	None documented	Sand, silt, clays	Supports modern land plants, grass prairies and forests	Fine for most uses unless thick muds are present, unit is unstable if water saturated	Records Holocene landscape development of south Florida
PLEISTOCENE – HOLOCENE	Beach ridge and dune (Qbd); Pleistocene/Holocene, undifferentiated (Qu)	Varied deposits of siliciclastics, organics, and freshwater carbonates that are light gray, tan, brown to black in color, clean to clay-rich, some silty lenses, with occasional gravel in organic-bearing sands. Clay rich layers are blue green to olive green with some sandy and silty lenses. Occur in floodplain areas (Qal – alluvium), terraces, and ridges and dunes of sand grains.	Very low to low	High permeability of unit is unsuitable for waste treatment facilities, unstable for roads and buildings.	Clay rich units are slippery when water saturated, dune sands are unstable for visitor use	plant debris, roots, peat beds, freshwater mollusks	May contain Native American settlement remains and artifacts	None documented	Sand	Supports pine forests	Fine for most recreational use, good trail base	Records paleoshorelines
PLEISTOCENE	Miami Limestone (Qm)	Qm consists of two facies, an oolitic facies (white to orangish gray, poorly to moderately indurated, sandy, oolitic limestone) and a bryozoan facies (white to orangish gray, poorly to well indurated, sandy, limestone). Some quartz sand beds present.	Low to moderate	Unit is highly porous and permeable and forms much of Biscayne aquifer system, susceptible to karst processes, unsuitable for waste treatment facilities.	Sinkhole and solution hole collapse probable for this unit, high permeability passes contaminants quickly	Scattered fossils including a bryozoan zone, mollusks, and corals. Casts and molds are common	None documented	Oolite, bryozoan layers	Sand, limestone	Solution holes support tree islands and karst aquifer resistant copepods	Often forms irregular surfaces with solution holes, avoid for most visitor use facilities	Oolite and bryozoan facies record shoreline to lagoonal paleo-environments
PLEISTOCENE	Key Largo Limestone (Qk)	Unit is a fossil coral reef containing large coral heads with white to light gray, moderately to well indurated, fossiliferous, coralline limestone composed of coral heads encased in a calcarenitic matrix. Rare siliciclastic rich beds present.	Moderate	Unit is highly porous and permeable and forms part of Biscayne aquifer system, may be susceptible to karst processes.	Sinkhole and solution hole collapse probable for this unit, high permeability passes contaminants quickly	Corals, mollusks, bryozoans	May have provided material for early trade	Fossil coral heads	Limestone with calcarenites matrix	Solution holes support tree islands and karst aquifer resistant copepods	If highly dissolved, solution holes may present visitor hazard	Records paleo coral reef environments
PLEISTOCENE	Anastasia Formation (Qa)	Interlayered orangish brown sands and coquinoid limestones. Most layers are unindurated to moderately indurated. The coquina layers contain whole and fragmented mollusk shells in a sandy matrix with sparse sparry calcite cements. Sand rich layers are light gray to tan and orangish brown. Fossils vary from bed to bed.	Low to moderate	Unit forms part of the surficial aquifer system. Coquina layers and inherent heterogeneous layering may render unit unstable for foundations.	Heterogeneity of unit renders it unstable under loads and if undercut, high permeability passes contaminants quickly	Abundant mollusk shells	May have provided material for early trade	Coquina, sparry calcite	Coquinoid limestone	None documented	Fine for most visitor use	Records environmental – climatic shifts during the Pleistocene

Age	Map Unit (Symbol)	Unit Description	Erosion Resistance	Suitability for Development	Hazards	Paleontologic Resources	Cultural Resources	Mineral Specimens	Mineral Resources	Habitat	Recreation	Global Significance
TERTIARY (QUATERNARY)	Shell-bearing sediments (TQsu); Dunes (TQd); Reworked Cypresshead Formation (TQuc)	Mollusk-bearing sediments includes the Callosahatchee, Bermont (informal), and Fort Thompson Formations all characterized by fossiliferous sands and carbonates. Units are complex varying from unconsolidated, variably calcareous and fossiliferous quartz sand layers to well indurated, sandy and fossiliferous limestones. Marine and freshwater carbonates present. Interbedded with the sand and shell layers are clayey sands and sandy clays. Dune sediments are fine to medium quartz sand with some organic matter (dunes at elevations greater than 30 m). TQuc is siliciclastics with fine to coarse quartz sands and some scattered gravel lenses with clay matrices.	Low to moderate	Units form part of the surficial aquifer system, partially unconsolidated layers and heterogeneous nature of unit may render it unstable for building foundations, high permeability may prove unsuitable for waste treatment facility development.	Heterogeneity of unit renders it unstable under loads and if undercut, carbonate layers are susceptible to dissolution and karst processes, high permeability passes contaminants quickly	Biostratigraphic layer with incredible fossil array; unit is paleontologically not well defined	None documented	Fossil shells	Sand, clay, scant gravel	Supports modern land plants	Fine for most recreation unless dissolved carbonate layers are present, sand layers make good trail base	Records Tertiary – Quaternary transition in Florida including some arid climatic periods
TERTIARY (PLIOCENE)	Cypresshead Formation (Tc)	Unit is composed of shallow marine, near shore siliciclastic deposits. Unit is reddish brown to reddish orange fine to very coarse sands with varying clay content. Some crossbeds are present locally along with quartzite pebble and mica lenses. Unit is primarily unconsolidated to poorly consolidated	Low	Permeable sands form part of the surficial aquifer system. Unconsolidated units may prove unstable for development.	Unconsolidated layers are susceptible to sliding if undercut, unstable, high permeability passes contaminants quickly	Preserved molds and casts of mollusks, burrow structures, trace marine fossils	None documented	Micas	Quartzite pebbles, sand	None documented	Fine for most recreational use	Records Pliocene near shore to deltaic environments
TERTIARY (PLIOCENE)	Tamiami Formation (Tt)	Unit is characterized by mixed carbonate and siliciclastic layers with several members including an oyster facies, a sand facies, several marl and limestone layers, and a reefal member. Unit includes light gray to tan, fossiliferous sands, greenish sandy clay, calcareous gray sand, sandy fossiliferous limestone, and white to light gray, well indurated fossiliferous sandy limestone. Some packstone and pelecypod sand members present locally.	Low to moderate	Varying highly permeable to impermeable layers form a complex aquifer system with some exposures as part of the surficial aquifer system and lower beds forming part of the intermediate confining unit-aquifer system.	Carbonate rich layers are susceptible to sinkhole and solution hole collapse, contaminants pass quickly through dissolution voids	Molds, casts, with barnacle, mollusk, coral, echinoid, foraminifera, and calcareous nannoplankton, pelecypod, gastropod, serpulid, barnacle, and ostracode fossils present	May have provided material for early trade	fossils	Phosphate is common in this unit present as sand to gravel sized grains	Supports cypress forests – wetland plants	If highly dissolved, solution holes may present visitor hazard	Records Pliocene lagoonal and reefal paleo-environments
TERTIARY (OLIGOCENE – MIOCENE)	Hawthorn Group: Peace River Formation (Thp); Bone Valley Member of the Peace River Formation (Thpb); Arcadia Formation (Tha)	Thp is composed of several facies of interbedded sands, clays, diatom layers, and carbonates with clayey matrices, variable dolomite. Sands are light gray to olive gray and phosphatic. Interbedded clays are yellowish gray with sand and silt lenses. Thbp contains abundant phosphate in interlayered sands, silts, clays, and phosphorites. Tha is mostly carbonate with some siliciclastics (sands, silts, and clays) locally as thin beds representing 4 distinct cycles. In outcrop, unit is yellowish gray to light olive gray-brown with variable clay, sand, phosphate, and limestone contents. Some dolostones are present locally.	Low to moderate; moderate (Tha)	Units form part of the intermediate aquifer system. Unconsolidated interbeds may render unit unstable.	Phosphatic layers may contain radioactive minerals, heterogeneity of units renders them unstable under loads and if undercut, carbonate layers are susceptible to dissolution and karst processes, high permeability passes contaminants quickly	Mollusks, casts, molds, corals and wood with some vertebrate fossils, sharks teeth, coccoliths including *Coccolithus pelagicus, Calcidiscus macintyrei, Recticulofenestra pseudoumbilica, Ceratolithus armatus, Discoaster pentaradiatus, Discoaster surculus*, diatoms, pelecypods, gastropods, echinoids, foraminifera, red algae	Chert may have provided tool material	Opaline chert, opalized claystones	Phosphate viable for mining	None documented	Not present at surface in Everglades area, outcrops north of park	Represents Pliocene – Miocene transition with periodic arid conditions alternating with shallow marine environments