Neogene Sand-to-Pebble Size Siliciclastic Sediments on the Florida Peninsula: Sedimentary Evidence in Support of the Genesis Flood

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Abstract

The uplift and erosion of the southern Appalachian Mountains provided geologic materials that were transported southward across the Atlantic and Gulf Coastal Plains. For a period of time the Suwannee Strait/Gulf Trough separated clastic sedimentation on the coastal plain from carbonate deposition out on the Florida Peninsula. Once the terrigenous sediments bridged this impediment, they rapidly spread southward across northern Florida. Subsequent regional tilting and widespread erosion along the Florida peninsula subjected these coarse siliciclastic sediments to further transport, eventually propelling them to the northern Florida Keys. In the Naturalist interpretation we would expect the particle size of the transported sediments to diminish southward across the peninsula due to both mechanical and chemical weathering over the purported millions of years. However, the identification of quartzite pebbles beneath the northern Florida Keys raises questions about this uniformitarian expectation. An alternative interpretation based on the consistent average quartz pebble particle size extending the length of the Florida Peninsula would suggest that the geologic energy necessary to erode, transport, and deposit the siliciclastic sediments from the southern Appalachians to the northern Florida Keys (approximately 650 miles) is better understood within the high energy framework of the global Flood of Genesis.

Introduction

The Florida peninsula is composed of a variety of geologic materials (e.g., sands, silts, clays and carbonates). Uniformitarian geoscientists have proposed that over the course of millions of years, the southern Appalachians shed siliciclastic sediments southward over the Atlantic and Gulf Coastal Plains and eventually across the submerged carbonate Florida Peninsula. Extensive quarrying, drilling, and coring along the peninsula have revealed a stratigraphic layer that is consistent with this expectation. The quartz-rich sediments range in size from fine-grained sands to quartzite pebbles, some up to three inches (7.6 cm) in their longest dimension, but more typically in the 1.5 inch (3.8 cm) range. The siliciclastic sediments extend down the entire length of the Florida peninsula (Pirkle, 1960; Pirkle et al., 1964; Winker and Howard, 1977a; Warzeski et al., 1996; Cunningham et al., 2003).

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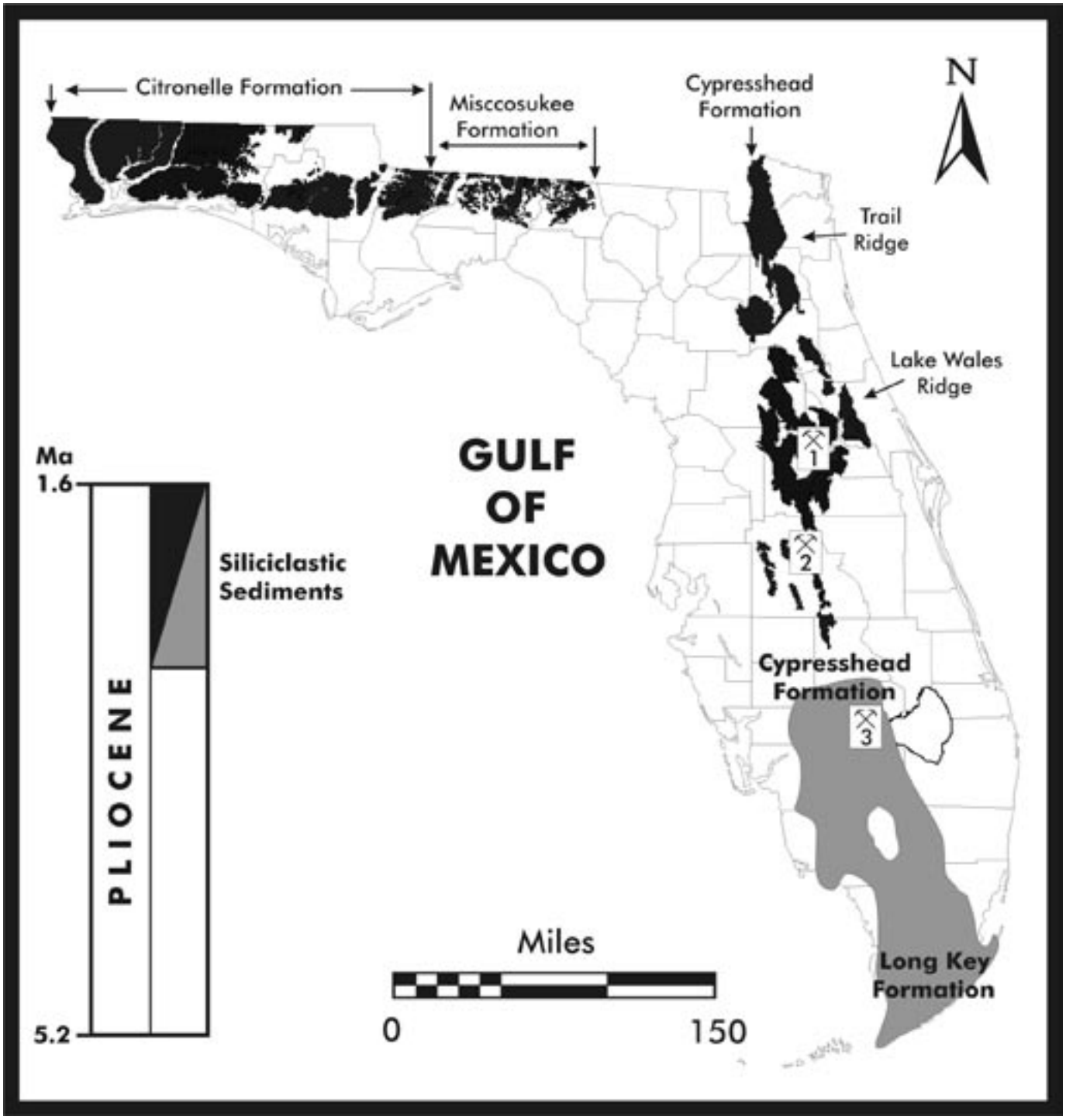

Figure 1. Geologic map showing the surface exposures (in black) of siliciclastic sediments that contain sand to pebble size quartz material derived from the southern Appalachian Mountains (Modified from Scott, 2001; Warzeski et al., 1996). The Cypresshead and Long Key formations in south Florida are in the subsurface and shaded gray. Scott (2001) has defined all of these quartz-rich sediments to the upper Pliocene. Surface mines where quartz pebbles were collected are shown in the three areas with crossed pickaxes. The volume and dimensions of the quartz sediments that extend the entire length of the peninsula demonstrate the tremendous geologic energy expended during the Flood.

An investigation was conducted to determine if the siliciclastic sediments (i.e., quartzite pebbles and coarse sand particles) could be linked as a single lithostratigraphic unit along the entire length of the Florida Peninsula and to ascertain the timing and nature of the geologic forces necessary to erode, transport, and deposit this material from the Southern Appalachians to the northern Florida Keys.

Pliocene Sediments

Geologists working across Florida have long been aware of the siliciclastic surficial sediments that extend across much of the State. Age dating these materials has proven to be problematic as paleontological material is generally lacking. The similar lithology of these sediments and their overall homogeneity had relegated them to a single lithostratigraphic unit that correlates to the Neogene Period (i.e., Miocene and Pliocene Epochs). More recently, Scott (2001) assigned this lithostratigraphic unit strictly to the Upper Pliocene. These coarse-grained clastic sediments have been identified in: 1) the Citronelle Formation along the western panhandle, 2) the Miccosukee Formation on the eastern panhandle, 3) the Cypresshead Formation along the peninsula, and 4) the Long Key Formation in the subsurface of south Florida (Figure 1). The scope of this investigation was limited to the stratigraphic units that contain siliciclastic sediments ranging in size from sand (1/16 mm to 2mm) to pebbles (specifically in the range of 4 mm to 5 cm) consistent with the modified Wentworth grain-size scale for siliciclastic sediment (Ingram, 1989).

Citronelle Formation

Before 1916, geologists identified the "Orange sand" of the Gulf Coastal Plain by many different stratigraphic names. Matson (1916) was the first to name and define the geological type section near Citronelle, Alabama, and Berry (1916) dated the Citronelle Formation to the Pliocene Epoch. However, this has not gone unchallenged due to the poor paleontological content of the sediments (Roy, 1939; Carlston, 1951; Stringfield and LaMoreaux, 1957; Doering, 1958; Isphording and Lamb, 1971). More recently, Otvos (1998a, 1998b, 2004) identified the Citronelle Formation as the most extensive surficial stratigraphic unit between the Mississippi River and east Florida, and he age-dated this formation to the Upper Pliocene based on recent pollen discoveries (1998b, 2004).

Regarding the Citronelle Formation in Florida, Scott (1991) stated:

> As it is currently recognized, the Citronelle Formation occurs only in the panhandle. The unit is recognized from central Gadsden County on the east to the western boundary of the State. The Citronelle Formation is composed of very fine to very coarse, poorly sorted, angular to subangular quartz sand. The unit contains significant amounts of clay, silt and gravel which may occur as beds, lenses or stringers and may vary rapidly over short distances (p. 10).

Otvos (1998a) set the Citronelle depositional paleoenvironment as:

> ...coarse- and fine gravelly sands deposited in major and minor stream channels, substantial fine-grained floodplain and channel-fill lithosomes and widespread, locally predominant finegrained [sic], rarely organic-rich floodplain units. Cyclic interlayering of fine and coarse-grained beds and indications of channel bank erosion (minuscule-to-sizable clay/mud clasts) and reworking are very common and stream meander-indicative lateral accretion beds absent (p. 1788).

Miccosukee Formation

The Miccosukee Formation has limited distribution across the eastern panhandle. It was originally named by Hendry and Yon (1967) for outcrops found across Jefferson and Leon Counties and dated to the Upper Miocene.

Hendry and Yon (1967) describe the Miccosukee Formation as:

> ...composed of continental interbedded and cross-bedded clay, sand and gravel of varying coarseness and admixtures. Most of the strata show lateral changes in thickness, stratification, texture, and composition even though the deposits are widespread (p. 252).

Scott (1991, 2001) stated that the Miccosukee extends from eastern Madison County and transitions through a broad facies moving west where it eventually grades into the Citronelle Formation in Gadsden County, Florida. The Miccosukee is no longer considered Miocene but Upper Pliocene (Scott, 2001) despite the discovery of Miocene age fossils of horse and rhinoceros teeth contained within it (Yon, 1965).

Cypresshead Formation

The Cypresshead Formation was first used by Huddlestun (1988) to describe Pliocene strata that predates the Pleistocene terraces of southeastern Georgia. Scott (1988a) extended the formation into Florida.

According to Scott (2001), the Cypresshead Formation:

> ...is composed of siliciclastics and occurs only in the peninsula and eastern Georgia. It is at or near the surface from northern Nassau County southward to Highlands County forming the peninsular highlands….The Cypresshead Formation consists of reddish brown to reddish orange, unconsolidated to poorly consolidated, fine to very coarse

> grained, clean to clayey sands. Cross bedded sands are common within the formation. Discoid quartzite pebbles and mica are often present. Clay beds are scattered and not areally extensive. In general, the Cypresshead Formation in exposure occurs above 100 feet (30 meters) above mean sea level (msl)….It appears that the Cypresshead Formation occurs in the subsurface southward from the outcrop region and similar sediments, the Long Key Formation, underlie the Florida Keys (p. 20).

Long Key Formation

Well cores obtained from locations in the northern Florida Keys have revealed an extensive siliciclastic layer within the subsurface (Ginsburg, Browne, and Chung, 1989). This unit was originally defined within the Peace River Formation (Warzeski et al., 1996) but was later renamed the Long Key Formation due to the significant lithostratigraphic differences between this unit and the bounding carbonate strata (Cunningham et al., 1998).

The Long Key Formation is identified as:

> ...a succession of subsurface siliciclastics up to 145 m [476 feet] thick underlying southernmost Florida... (Cunningham et al., 1998, p. 249, brackets added).

The lithofacies characteristics of the Long Key Formation are derived from a single well core on Long Key (W-17156, FGS-Long Key No. 1) and the formation is described as an unconsolidated to poorly consolidated quartz sand or sandstone with particle sizes ranging from silt to pebble (Cunningham et al., 1998).

Two other well cores in the northern Florida Keys (i.e., one at Marathon and another at Silver Shores) also exhibited an extensive interval of quartz sands and pebbles. According to Warzeski et al. (1996), the Marathon well (W-12799) "... contains a 44 m [144 ft] thick section of rounded granule- and pebble-size grains of quartz or phosphate in a matrix of clean, fine to course, white quartz sand" (p. 791, brackets added). The core at Silver Shores (W-12973) contained a 164-foot-thick (50 m) siliciclastic layer with quartz pebbles identified in the middle of the section (Warzeski et al., 1996).

This massive siliciclastic layer is bounded in the subsurface by carbonate units. The upper carbonate layer varies in thickness from 33 feet (11 m) south-southwest of Miami, to 131 feet (40 m) in the northern Florida Keys (Warzeski et al., 1996), and forms the Quaternary carbonate shelf and coral reef tract (Enos and Perkins, 1977).

Depositional Setting

Florida Peninsula – Cypresshead Formation

A wide variety of depositional settings have been suggested by uniformitarian geologists to explain the siliciclastic sediments and kaolinitic clays along the Florida peninsula. Davis (1916) suggested that the clays were likely deposited on a floodplain. Investigation of the cross-bedded quartz sands and pebbles in the Lake Wales Ridge of the central Florida peninsula led Bishop (1956) to suggest that the sediments represented deltaic foresets. Altschuler and Young (1960) interpreted the sand deposits to be the result of intensive lateritic weathering of the former sediment mantle that stretched across the Florida Peninsula. Klein et al. (1964) suggested that the quartz pebbles in Hendry County, Florida, represented a channel lag of a deltaic finger that progressed southward across Highlands County during the Late Miocene. The idea of a large prograding river delta moving southward down the Florida peninsula has also been advocated by several geologists working across this portion of the State (e.g., Pirkle et al., 1964; Puri and Vernon, 1964; Peacock, 1983).

However, the concept of a river flowing down the peninsula has not met with complete acceptance. Winker and Howard (1977a) stated that:

> It is difficult to understand why a major river, presumably originating in Georgia, should avoid the most direct routes to the sea, such as the Altamaha and Apalachicola Rivers follow today, and proceed for a few hundred kilometers almost down the center of an active structural arch, to deposit its bedload as a number [of] long, parallel sand ridges (p. 417, brackets added).

Regarding the likelihood of a Neogene age river prograding down the Florida peninsula, Hine (1997, p. 172) stated that, "Most likely, there were no south- or east-flowing sediment-bearing streams on the Florida Platform south of the present St. Johns River."

Other investigators have proposed that the coarse, clastic sediments reflect a nearshore marine depositional setting best represented by longshore transport (Bell, 1924; Martens, 1928; Cooke, 1945; Hoyt, 1969; Alt, 1974; Winker and Howard, 1977a; Kane, 1984; Hine, 1997).

That siliciclastics extend along the entire length of the Florida peninsula is not debated. However, the postulated depositional setting remains unresolved and open for further discussion. It should be noted that the size of the quartz pebbles and manner of sediment mixing does not appear to be an impediment to either depositional model. However, for the larger particles found along the peninsula, Pirkle et al. (1964, p. 1125) stated that, " ...the Citronelle sediments were swept by strong currents is evidenced by the transportation of quartz granules and quartzite pebbles...."

South Florida – Long Key Formation

In south Florida, the nature and form of the subsurface quartz-rich sand and pebble deposits initially led investiga-

tors to suggest that the paleosetting was a nearshore beach to barrier island environment. According to Warzeski et al. (1996):

> This pathway of maximum paleocurrents, about 100 km [62 miles] wide, is interpreted as the palimpsest record of unusually strong, southward-moving shoreline and channel deposition or a giant prograding spit. The ultimate source of these siliciclastics is from the Appalachians, approximately 1000 km [621 miles] to the north. We contend that southward entry of the siliciclastics into southernmost Florida was deflected eastward by west-to-east channeled flow of an ancestral Florida Current (p. 788, brackets added).

These siliciclastic sediments spread across the south Florida platform in channels up to 164 feet (50 m) deep across a broad area 62 miles (100 km) wide (Warzeski et al., 1996). Seaward of the Keys these sands form geometries suggestive of slump deposits which have been reworked by contour currents resulting in contourites (Warzeski et al., 1996). These types of deposits (i.e., contourites) are more typically associated with deep water currents and suggest that the water level during the time the sands were prograding southward might have been much deeper than is presently understood.

However, the prograding spit concept is not the only depositional model suggested to explain the siliciclastic sediments found in south Florida. Some geoscientists view these deposits as having formed within a fluvial/deltaic setting. In describing the size and form of the quartz-rich sediments extending across south Florida, Cunningham et al. (2003) stated that:

> ...the width and thickness of this set of clinoforms is comparable to the Holocene Balize and Plaquemine deltaic lobes of the Mississippi River. However, we do not propose that the huge height and width of the aggrading complex of clinoforms are evidence of a fluvial system the size of the Mississippi delta, but the large size of the clinoform complex does suggest a depositional system that is unprecedented in scale relative to any fluvial or coastal marine depositional system operating today in the eastern Gulf of Mexico (p. 42).

To explain the somewhat laterally confined nature of the large-scale fluvial-deltaic strata, Cunningham et al., (2003) further proposed that:

> Antecedent relief, present on the upper sequence boundary at the top of SS1, funneled the inferred delta axis southward along the middle of the Florida Platform. If the deltaic interpretation of the Caloosahatchee River seismic data is correct, then the Late Miocene–Early Pliocene siliciclastics beneath the middle and northern Florida Keys were probably transported about 200 km [124.3 miles] southward in association with Late Neogene fluvial-deltaic progradation (p. 43, brackets added).

Two different uniformitarian depositional models can be invoked to explain the siliciclastic sediments found in south Florida. Unfortunately, the nature of the sediments does not readily yield itself to a clear depositional model within the uniformitarian framework. However, the particle size of the quartz pebbles requires considerable energy.

Tectonism and the Suwannee Strait

According to uniformitarian interpretation, the southern Appalachian basement became exposed at some point following the termination of the Alleghenian orogeny which ended 300 Ma. The igneous basement rocks, specifically the quartzite materials, provided the source sediments for the Neogene siliciclastic sediments found across the Atlantic and Gulf Coastal Plains. These terrigenous sediments were carried southward across the coastal plain but did not continue down the Florida Peninsula until the Suwannee Strait/Gulf Trough was crossed (Dall and Harris, 1892; Hull, 1962; Puri and Vernon, 1964; Husted, 1972; Pinet and Popenoe, 1985; Popenoe et al., 1987). (It should be noted that the Suwannee Strait and Gulf Trough are often confused as they generally occur along the same axis. The Suwannee Strait extended from modern Apalachicola, FL to Charleston, SC. It is interpreted as a broad channel connecting the Gulf of Mexico to the Atlantic. The Gulf Trough is more typically interpreted as a structural embayment that extended from Apalachicola to near McRae, GA. It did not connect the Gulf to the Atlantic. They both served as barriers to the southward transport of siliciclastic sediments and are thus combined here.)

Cunningham et al. (2003) provides a concise summary explaining the uniformitarian geologic history of the Suwannee Strait:

> From the Middle Cretaceous to the Late Paleogene, a structural low called the Suwannee Strait or Gulf Trough separated the carbonate Florida Platform from a clastic shelf and slope at the southeastern part of modern North America, and was key to maintaining carbonate sedimentation on the platform. In the Middle Cretaceous a strong current began to flow through this low Suwannee Strait or Gulf Trough creating a sharp facies boundary between siliciclastics originating in the southern Appalachians to the north and the carbonate mega-platform to the south. Currents moving through the seaway from the Gulf of Mexico to the Atlantic precluded transport of siliciclastic sediment and nutrients from interrupting carbonate growth on the Florida Platform. Development of a paleo-Florida current during the Paleocene to Early

> Eocene (?) weakened the current through the Gulf Trough, and in conjunction with inferred uplift of the Appalachian Mountains, contributed to infilling of this seaway. The Gulf Trough was closed by the Late Eocene, allowing the dispersal of siliciclastics to the eastern part of the Florida Platform, where they mixed with carbonates during the Oligocene to Late Miocene (p. 31).

Numerous arches and basins occur along the entire length of the Florida peninsula (Figure 2). Originally, several of these features were interpreted to be the result of tectonism that occurred during the Tertiary (Puri and Vernon, 1964; Hoyt, 1969; Galloway et al., 1991; Riggs et al., 1991). More recently, it has been proposed that no tectonic deformation or orogenic activity occurred along the peninsula during the Cenozoic and these arches and basins are the result of regional tilting, karstification, and differential erosion (Winston, 1976; Winker and Howard, 1977b; Opdyke et al., 1984; Scott, 1988b, 2001; Smith and Lord, 1997). However, not everyone is in agreement, at least not for south Florida (Cunningham et al., 1998) and the role that tectonism and subsidence played in the funneling of siliciclastic sediments along the Florida peninsula to the south Florida Basin is being further explored.

Figure 2. Most of these geologic structures are interpreted by uniformitarians to have formed before the Tertiary; however, questions remain. The Suwannee Strait/Gulf Trough features occur along the same axis with the Strait extending all the way to the Atlantic. The Gulf Trough only extended across a portion of the Georgia Coastal Plain. The arrow points in the perceived water flow direction. Within the Creation/Flood framework it is postulated that the numerous geologic structures identified on this map formed during the Flood and those along the Florida Peninsula enhanced the southward transport and deposition of the siliciclastic sediments. Modified from Scott (2001).

Sea Level Changes and Siliciclastic Deposition

According to uniformitarian interpretation, the deposition of Cretaceous and Tertiary sediments across the southeastern United States is related to the slow withdrawal of global sea level. The blanket of siliciclastic sediments that formerly extended across northern Florida and down the Peninsula has been partially eroded away leaving such prominent elevational features as the Trail Ridge and Lake Wales Ridge. Accommodating the deposition of these quartz-rich sediments along the elevated Florida Lake Wales Ridge in central Florida would require a sea-level position approximately 140 feet (42.7 m) higher than at present (Pirkle et al., 1964).

Discussion

Sedimentologists have documented the relationship between particle size and transport distance. Predictably, the particle diminishes in size the farther it is transported. Of course, many factors such as hydraulic gradient, material hardness, and abrasiveness of the load all play a part in the breakdown of the transported materials. However, the consistent average size of the quartzite pebbles found along the entire length of the Florida Peninsula does not appear to correspond to the particle size expected when considering the transport distance and duration in which this is purported to have occurred (Figures 3, 4, 5, and 6). This was a highly unusual and energetic setting in any postulated uniformitarian depositional model.

The velocity and volume of water necessary to transport rounded and flattened pebbles from the southern Appalachians to the northern Florida Keys is perplexing. While significant topographic relief would be expected between the uplifted southern Appalachians and the adjacent Atlantic and Gulf Coastal Plains (potentially on the order of several thousand feet), no such drastic elevation differences would be expected between northern Peninsular Florida and the Keys even with regional tectonic tilting. The trans-

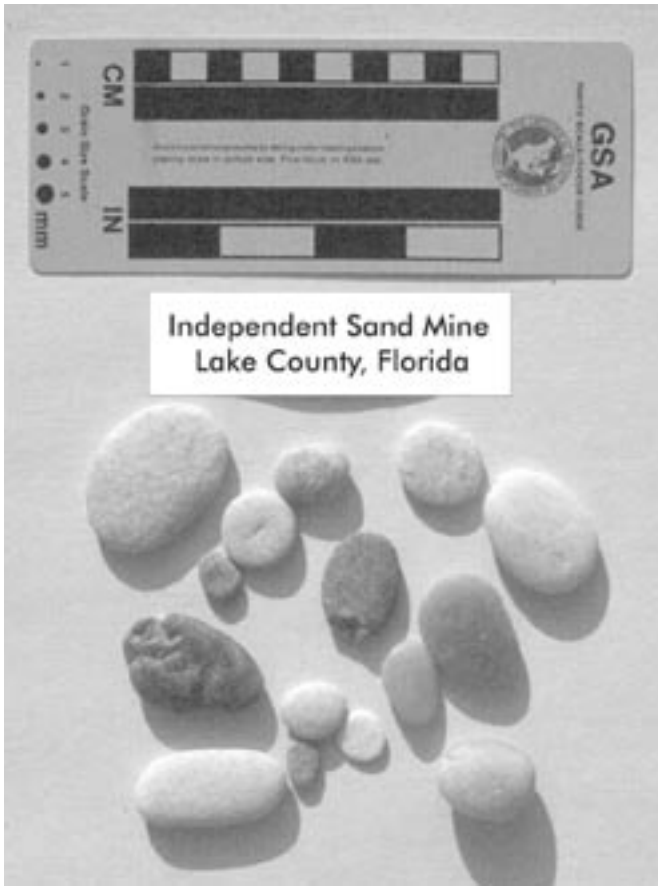

Figure 3. Quartzite pebbles from the Independent Sand Mine in Lake County, Florida. Pickaxe number one in Figure 1 shows the general location in the Lake Wales Ridge area.

port of coarse quartzite sediment averaging 1.5 inches (3.8 cm) in diameter within the hypothesized fluvial/deltaic uniformitarian setting does not appear probable. Alternatively, invoking the transport and concentration of the larger quartzite pebbles by longshore drift would probably only occur under highly energetic storm conditions. The energetic setting within the uniformitarian interpretative framework necessary to explain this lithostratigraphic blanket across the Florida Peninsula remains unresolved.

Creation-Flood Framework

The Creation-Flood framework does not preclude the correlation of sediments from a source area near the modern day southern Appalachians, across the Atlantic and Gulf Coastal Plains, and even extending out on the Florida peninsula. However, this detailed work remains to be conducted. While uniformitarian geologists interpret the uplift and erosion of the southern Appalachians over the course of 465 Ma spanning three major periods of orogenic activ-

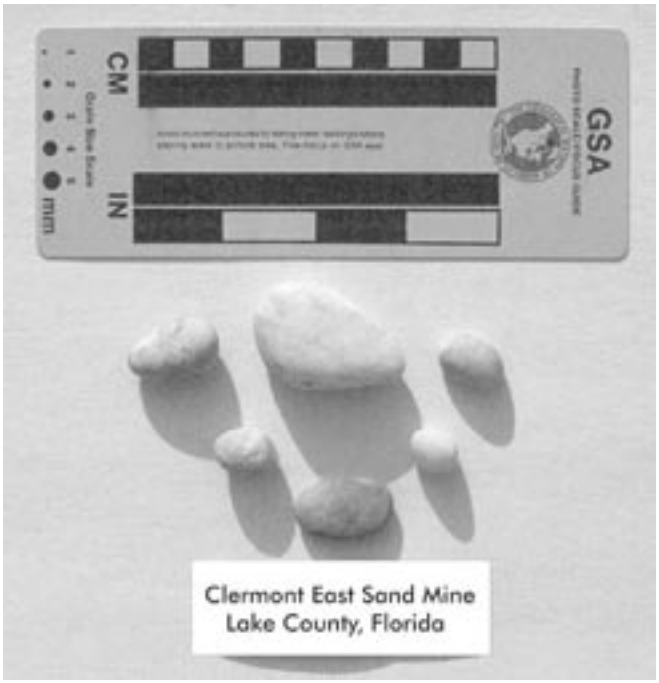

Figure 4. Quartzite pebbles from the Clermont East Sand Mine in Lake County, Florida. Pickaxe number 1 in Figure 1 shows the general location in the Lake Wales Ridge area.

Figure 5. Quartzite pebbles from Haines City Mine on the eastern flank of the Lake Wales Ridge in Polk County, Florida. Pickaxe number two in Figure 1 shows the general location in the Lake Wales Ridge area.

Figure 6. Quartzite pebbles from the Ortona Sand Mine in Glades County, Florida. Pickaxe number three in Figure 1 shows the general location in the gray shaded area adjacent to Lake Okeechobee.

ity (i.e., Taconic, Acadian, and Alleghenian), young-Earth creationists must operate within a much shorter period of time and with greater geologic energy (Froede, 1995, 1998; Reed, Froede, and Bennett, 1996; Reed, 2001).

The expectation of a higher than present sea-level position necessary to wash sediments from the southern Appalachian Mountains down to south Florida is not counter to the uniformitarian belief that sea level was higher during the Pliocene Epoch. Elevated Floodwater conditions easily correspond to the perceived uniformitarian aqueous conditions of this portion of the Pliocene. Our interpretative differences occur in both the magnitude of energy and time duration in which this lithostratigraphic unit was formed.

Within a Biblical framework, sediments found either at the surface or in the subsurface across the southeastern United States could be defined within several possible geologic intervals (i.e., Creation Week, Antediluvian, Flood Event, Ice Age, and Present Age Timeframes) [Froede, 1995, 1997, 1998]. However, the various major and minor orogenic periods would all likely correlate to the Flood Event Timeframe. Within this Creation/Flood framework, discussion is now limited to the siliciclastic sediments found along the Florida peninsula.

Source Areas

Uniformitarian geologists invoke eroded Appalachian basement rocks as the source of the siliciclastic sediments found across the Florida peninsula. However, there are two possible source options: 1) the siliciclastics were created along the Florida peninsula in situ during the Creation Week or, 2) the quartz-rich sediments were eroded from the uplifted southern Appalachian Mountains, transported, and deposited as a result of the global Flood of Genesis. I believe that the latter option is the best interpretation within the Creation/Flood framework (Figure 7). The uplift of the southern Appalachians during the early stages of the Flood would have enhanced the erosion and removal of any overburden above the metamorphic and igneous basement (see Froede, 1998, chapter 8). Once exposed to the force of energetic floodwater, the igneous basement rocks would have rapidly eroded. The transport of this geologic material under the direction of Flood currents would have occurred somewhat radially off the area of uplift, with much of the material being transported southward across the Atlantic and Gulf Coastal Plains. The Suwannee Strait/Gulf Trough only temporarily impeded the spread of sediments southward. Once that channel was filled, the quartzite materials were transported across the coastal plain and down into northern Florida.

Middle Flood Initiated Sediment Erosion, Transport, and Deposition

The southward-directed tilting of the Florida peninsula during the Middle Division of the Flood Event Timeframe provided a gradient and enhanced the progradation of siliciclastic sediments along the northern portion of the Florida peninsula. Areas of siliciclastic accumulation (e.g., Trail Ridge, Lake Wales Ridge, and other smaller topographic features) occurred as the sediments were transported further south, eventually reaching the South Florida Basin located beneath the northern Florida Keys. I believe that many of the tectonic features found along the peninsula were created as the siliciclastic sediments were being transported southward. These areas of uplift and downwarping served to confine and direct the quartz-rich materials as they spread southward to the northern Keys.

Conclusion

The concept of a continuous sandy deposit containing quartz pebbles originating from the southern Appalachians and extending down the entire length of the Florida Peninsula appears to defy imagination. Uniformitarian and Creation/Flood geoscientists agree that vein quartz derived from basement rocks in the southern Appalachian Moun-

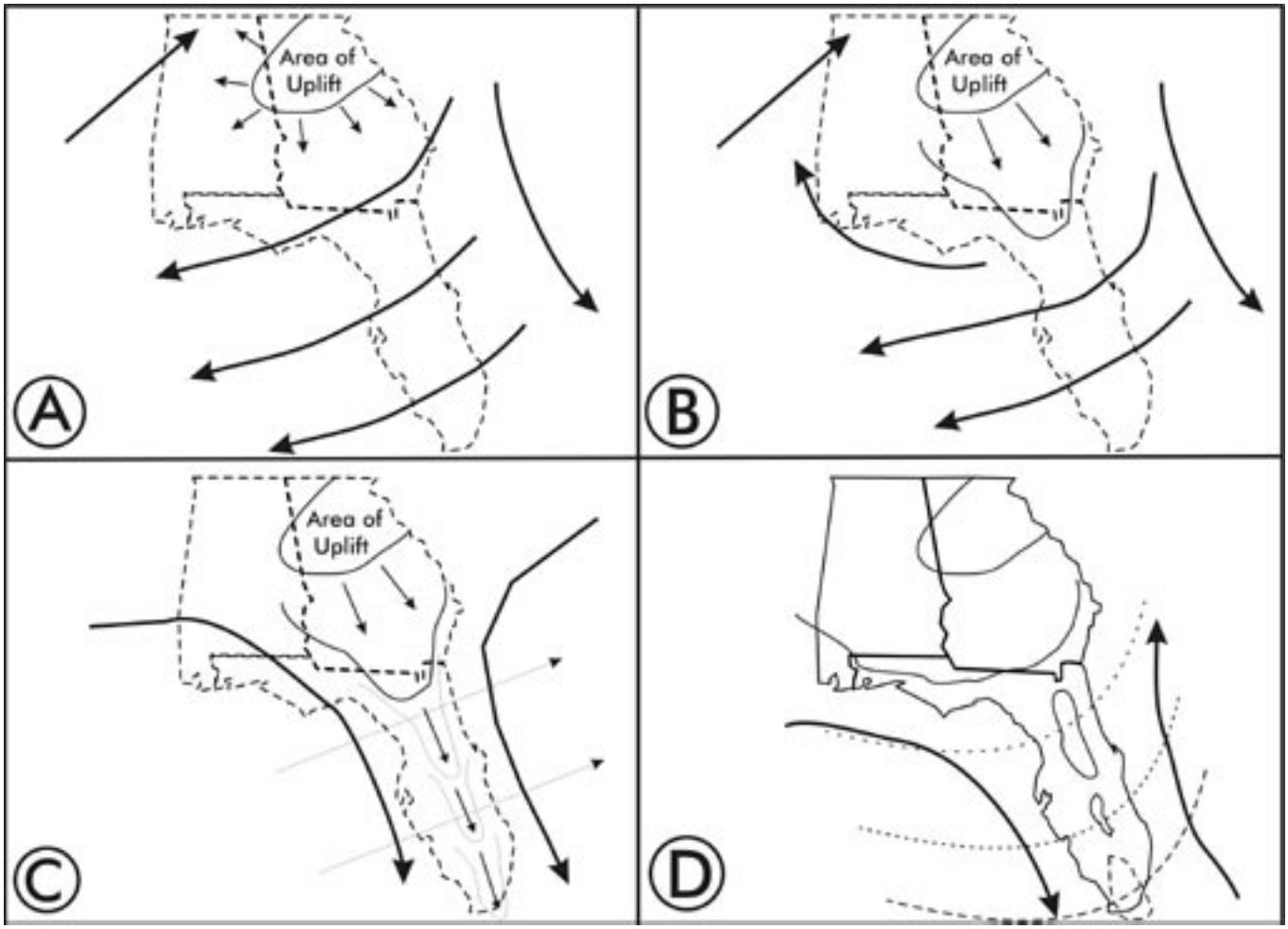

Figure 7. Hypothesized Flood scenario showing; A—The Appalachian uplift which subjected the overlying geologic materials to erosion and transport, B—Floodwater currents still overtop the area of uplift but largely deflect and trend southward aiding the transport of sediments, C—With a combination of uplift and sea level decrease, the sediments are energetically transported southward across the Florida peninsula to the northern Florida Keys, D—The small dashed lines generally perpendicular to the Florida peninsula reflect the withdrawal of Floodwater and the erosion of the siliciclastic sediments that were exposed along the surface or near surface of the submerged peninsula. The dash-outlined lobe in south Florida represents the quartz-rich sediments that were later covered by carbonate material as the Floodwater withdrawal rate slowed and coral reefs were established across this portion of the State.

tains is the source of this siliciclastic sediment. However, significant differences occur in the timing and manner in which these deposits were formed.

Uniformitarian geoscientists generally recognize these coarse-grained siliciclastic sediments as one lithostratigraphic unit of equal age (i.e., Pliocene). The volume and areal extent of the quartz-rich sediments that stretch from the southern Appalachians to the northern Florida Keys appears to require greater energetic conditions than might be expected or allowed within the naturalist framework. Factors necessary to defend this interpretation (e.g., differences in topographic relief, possible tectonism, water current velocity, and sedimentary setting) have not been detailed due to the apparent limitations of the various depositional models within the uniformitarian framework.

Young-Earth creationists would propose that the nature, volume, and areal extent of the siliciclastic sediments reflect conditions that could only be expected in association with the global Flood of Genesis. The sourcing of the siliciclastic sediments, their erosion and transport across the Atlantic and Gulf Coastal Plains and down the Florida Peninsula, along with the tectonism necessary to form this

lithostratigraphic unit were all accomplished during the highly energetic Middle Flood Event Timeframe. The eventual reduction in geologic energy probably coupled with the deepening of the oceanic basins provided the slow withdrawal of Floodwater from the peninsula. This allowed carbonate deposition to occur across the still submerged southern portion of the Florida Peninsula and resulted in the eventual establishment of the Florida Keys Coral Reef Tract (Froede, 1999).

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AAPG: American Association of Petroleum Geologists

CRSQ: Creation Research Society Quarterly

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