

Late Miocene to Early Pliocene Fluvial Transport of Siliciclastic Sediment onto the Southern Florida Platform

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ABSTRACT

Coarse siliciclastic sediment occurs in late Miocene-aged paleochannels and in a wide group of depositional environments over a large portion of southern Florida. This sediment includes sand, granule, and pebble-sized grains of variable composition. Discordoidal quartz and feldspar pebbles occur within bedded deposits of mixed siliciclastic and carbonate sediments. The siliciclastic sediments are essentially flat-bedded in seismic reflection profiles and occur within channels. The flat-lying siliciclastic sediment are overlain by deltaic deposits of mixed siliciclastic and carbonate sediments that exhibit topset and foreset bedding in seismic reflection profiles.

The sand-size fraction of the siliciclastic sediment contains a moderate (up to 14%) percentage of potassium feldspar and some of the grains contain alteration rims. The source of the siliciclastics is the southern Appalachian Mountains, which is a distance of over 400 mi north of the southern terminus of the southern Florida Platform. Transport of the siliciclastic sediment to southern Florida must have occurred via fluvial processes, because prolonged beach transport would not have allowed the preservation of the feldspar grains over the transport distance. The compositional maturity of the sands and long fluvial transport distance implies that the climate in the later Miocene was at least seasonally wet. Structural changes on the Florida Platform, and perhaps also at the southern Appalachian sediment source, may have created the necessary hydraulic gradient to allow for the fluvial transport of the coarse siliciclastics.