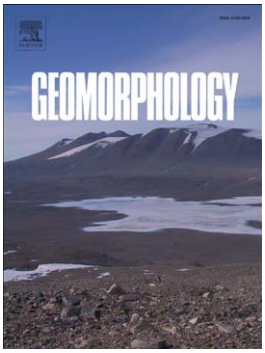

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Geomorphic Origin of Merritt Island-Cape Canaveral, Florida, USA: A Paleodelta of the Reversed St. Johns River?

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ABSTRACT

The Merritt Island-Cape Canaveral (MICCSC) sedimentary complex consists of a series of adjacent, non-conformable, beach ridge sets that suggest a multi-phase constructional history, but the feature's geomorphic and sedimentary origins are not well-understood. In spite of its notable sedimentary volume (surface area=1,200 km^2), the MICCSC lacks a clear sediment source, or supply mechanism, to explain its presence today. Previously published U/Th, radiocarbon and OSL dates indicate that beach ridge deposition was active during MIS 5 (130-80 ka) on Merritt Island, but has occurred over a shorter, younger time interval on Cape Canaveral proper (6 ka to present). In this paper, it is proposed that the MICCSC is an abandoned paleodelta whose fluvial source provided a sediment supply sufficient for coastal progradation. Although the MICCSC, today, does not receive an appreciable sediment supply, the nearly 23,000 km^2 drainage basin of the St. Johns River may well have provided such a sediment supply during MIS 5 times. This low-gradient fluvial system currently empties to the Atlantic Ocean some 200 km north of the MICCSC (near Jacksonville, Florida) but may have flowed southward during the time of MICCSC sedimentary construction, then experienced flow reversal since MIS 5 times. Three possible uplift mechanisms are proposed to explain the northward down-tilting that may have reversed the flow direction of the St. Johns, abandoning deltaic construction of the MICCSC: (1) karst-driven, flexural isostatic uplift in response to carbonate rock dissolution in central Florida, (2) glacio-hydro-isostatic tilting/back-tilting cycles during loading and unloading of the