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# Holocene Evolution of the Sixteen Mile Beach Complex, Western Cape, South Africa

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The Sixteen Mile Beach Complex is one of numerous active dune accumulations along the West Coast of southern Africa. The beach complex is composed of a sandy beach, coast-parallel dunes and a dune cordon. Grain size analyses, calcium carbonate content, sand texture and composition, and radiocarbon ages were determined to understand the Holocene evolution of the Sixteen Mile Beach Complex. Changes in sand grain size and dune morphology allow the complex to be divided into three parts. The beach and the dune cordon at the southern end are composed of fine sand. The central beach has a rapid decrease in the fine sand fraction that coincides with the transition from the dune cordon to a single large coast-parallel dune ridge. The northern beach is composed of medium sand and consists of a series of prograded, vegetated coast-parallel dune ridges. The formation of these distinct regimes is a reflection of the different amounts of wave energy received by the complex from the predominant southwest swell.

The radiocarbon analyses of bulk sand samples show a progressive younger age of the carbonate beach sand towards the north that reflect an increase in grain size and recently broken shell. The mean age of the beach is 2.4 ka based on an AMS date of picked pink colored carbonate grains. The fresh bulk carbonate beach sand has a mean age of 7.4 ka and reflects the presence of reworked Pleistocene beach and dune sand. Corrected bulk sand radiocarbon ages indicate that the dune cordon has been active since 4.5 ka with a mean dune migration rate of 5.3 m/y. However, variations in sand supply, sea level and climate indicate a complex and erratic evolution of the dune cordon.