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Aeolian deposits of Central and North Santa Catarina Coast – Brazil, as a record of climate and RSL changes

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Five areas with active and stabilized aeolian dune fields in the central coast of the Santa Catarina State, southern Brazil were studied. In this region, a recent tendency to stabilization of active dunefields, in the last three decades, is inferred from the comparison between aerial photographs of different years. Meteorological data obtained between 1962 and 2010, including daily records of rainfall, wind intensity and wind direction, indicate increasing precipitation and weakening wind to this period, that could be attributed to weakening of the South America Summer Monsoon System (SASM). The combination of those two factors inhibits the aeolian sediment transportation to the dune field. Being persistent in the last three decades, they have reduced gradually the sand areas exposed to aeolian reworking, decreasing the effective aeolian drift and culminating on the stabilization of dune fields. The relationship between 13 OSL (optically stimulated luminescence) ages and the relative sea level (RSL) and paleoprecipitation curves, allow us suggest that the initiation of the dune fields, can be favored by moments of stable RSL, as well by less humid and more windy weather. In other hand, the stabilization of the dune fields would be favored by higher RSL, increasing rain and decreasing wind intensity. From the perspective of climate control, the condition to initiation of dune fields agree with moments of weakening of the South America Summer Monsoon System (SASM). Analogously, the favorable condition for the stabilization of dune fields would coincide with moments of intensification of the SASM.