

A PRELIMINARY STUDY ABOUT CHANGES ON AEOLIAN SEDIMENTARY DYNAMICS IN BEACH-DUNE SYSTEMS THROUGH LONG-TERM MONITORING OF VEHICLE TRACKS AND HEAVY DUTY MACHINERY IN EL INGLÉS BEACH (GRAN CANARIA, SPAIN)

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Abstract: Beach-dune systems are coastal ecosystems highly susceptible to changes, especially those associated to human activities. This study is located in El Inglés beach (Canary Islands, Spain), which is the sediment input to the Maspalomas transgressive dunefield and where vehicles, especially beach cleaning machinery, circulate daily. The aim of this study is to take a first approach into long-term analysis of the topographic and geomorphological effects of vehicles and heavy duty machinery of the beach cleaning service and how it may affect aeolian sedimentary dynamics in beach-dune systems.

The methodology was divided into three sections: i) a spatiotemporal study of vehicle tracks on the beach through orthophotos (2002-2018); ii) a field campaign to observe and compile beach cleaning activities information to discriminate heavy duty machinery tracks; and iii) long-term analysis of the variables associated to topography and geomorphology.

The variation in vehicle track density was found to be related with the management actions through the years, depending on the number of tourists. Thus, different track densities (not homogeneous throughout the beach) could be related to the number of users and hence the intensity of beach use. The vehicle track densities showed a high correlation with the heavy duty machinery track densities obtained in the field campaign, which could explain the importance of this activity on the presence of tracks on the beach.

Significant differences were observed in the topographic profiles' behaviour along the beach, according to the vehicle track density obtained. However, an artificially-maintained steady beach with insignificant slope variation in the topographic profile was observed, contrary to the documented sedimentary deficit in the Maspalomas dune system. Therefore, mechanical cleaning does not have a sole and direct impact on sediment loss in the system but rather contributes to maintain the erosive areas responsible for sediment loss in the Maspalomas beach-dune system.

Key words: Arid coastal dune system, Maspalomas, vehicle tracks, mechanical cleaning, beach-dune management

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