

THE IMPACT OF BEACH KIOSKS ON ARID FOREDUNES

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Abstract: Beach-dune systems are some of the most visited touristic destinations. Infrastructure is often built to service visitors, which tends to occupy the public domain and puts pressure on beach-dune environments. Among other impacts, kiosks and other beach equipment can interfere with aeolian processes and modify sand flux patterns towards the dunes. In arid coastal dune systems, the presence of naturally discontinuous foredunes and the relative fragility of nebkha vegetation can lead to further complexities.

We investigate some of the environmental impacts associated with the presence of beach kiosks in *El Inglés* (Gran Canaria, Spain), a beach of specific interest because of the high levels of human pressure throughout the year. *El Inglés* is the main sediment supply to the Maspalomas transgressive dune field. The number and size of beach kiosks here have varied over time from their first installation in the 1970s, as the need to adapt to new environmental regulations came into place. However, and although *El Inglés* is an Area of Ecological Sensitivity since 1994, recommendations for designing more ‘aerodynamic’ kiosks have been so far ignored. In 2019, new rectangular-shaped kiosks of 20 m² were installed and still operate in the area.

This research investigates how the installation of kiosks leads to the development of deflation surfaces, foredune fragmentation, and changes to airflow dynamics. We present results from a field experiment at *El Inglés* beach-dune system specifically designed to measure near-surface (0.5 m above the ground) wind speeds and directions around a beach kiosk. A digital elevation model of the kiosk was created from topographic data collected in the field, which helped analyze interactions between this artificial landscape element, aeolian processes, and the development of deflation surfaces downwind. Implications for the design and location of kiosks and other beach equipment are discussed.

Key words: Maspalomas, beach equipment, beach-dune management, airflow patterns

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