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## **Impact of a possible local wind change on the wave climate in the upper Río de la Plata.**

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### **ABSTRACT**

The aim of the present work is to give a quantitative assessment of the change in mean wave parameters in the upper Río de la Plata (RDP) considering a possible change in local winds. A statistical analysis of the sea and swell in the outer RDP as well as the computation and analysis of their propagation and transformation throughout the intermediate and upper regions, reveal that refraction, shoaling and friction effects diminish wave heights by 94.9%. Consequently, predominant wave climate in the upper RDP could only be described considering wind waves locally generated (sea). The present wave climate (directional wave heights and periods) at the upper RDP is estimated by the hindcasting methodology based on a ten-year statistics of winds measured at “Aeroparque Jorge Newery” meteorological station. A possible future scenario is sketched for which wind frequencies and intensities for the East directions are respectively 30% and 10% higher than the present values. The results for the upper RDP show that mean East wave heights will increase by 0.12 m (13%) relative to present values (0.90 m) and their frequencies will increase by 30% (from 18.4 to 23.9%) producing larger total heights. Therefore, the coast of Buenos Aires City will be more frequently exposed to wave effects, giving rise to intensified associated littoral processes. The mean period for East waves will not change significantly (less than 4%, from 5.3 to 5.5 s). The results obtained herein are a first approximation to the problem, suggesting that within the upper RDP the wave climate is very sensitive to the predicted change in the wind field.