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Meteorological Conditions**

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WIND TIDES IN THE RIO DE LA PLATA ESTUARY: METEOROLOGICAL CONDITIONS¹

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ABSTRACT

Synoptic situations associated with strong southeasterly winds over the Rio de la Plata (RP) estuary are locally known as *sudestadas*. This phenomenon affects the coast of Buenos Aires city and its outskirts with floods, normally accompanied with persistent rainfall.

Storm surge levels (river level minus the astronomical tide levels) were used to identify cases associated with *sudestadas*. Although there is a local belief that most *sudestadas* are caused by cyclogenesis during winter, they actually occur during the whole year, being indeed less frequent in winter. In addition, they are not necessarily associated with cyclonic circulation. The maximum frequency of *sudestadas* is observed during summer and at the beginning of spring and autumn. This annual distribution was similar when two different water-level thresholds were used to characterize the storm surge.

The three principal components (PCs) of the atmospheric circulation field at 1000 hPa accompanying the *sudestada* explain 75% of the variance. These patterns show that *sudestadas* are associated with either a combination of a high-pressure system to the south of the RP and relatively low pressure to the north (first and second PC modes) or a very deep low-pressure zone to the north of the river (third PC mode). These cases are associated with southeasterly winds, which produce tide waves on the RP.

Almost all the *sudestadas* associated with the third PC occur in winter and they reach on average greater peak levels than the others. These cases are associated with an intense low-pressure system north of the RP, which is typically due to the frequent cyclogenesis in that region.

KEY WORDS: *sudestada*; Rio de la Plata; tide floods; storm surges

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