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Supporting Information I

SI.1 - Photographs emphasizing aspects of the study area. Their positions are indicated in Figure 1 of the article.

F.1 – Escarped foredunes. F.2 – Foredune protecting homes from the beach erosion. F.3 – Coconut trees with exposed roots revealing the existing erosion process. F.4 – Zone most affected by erosion. Use of fences and stones to contain the sea´s action. F.5 – Transgressive dunes. Figure F.6 – Field of dunes that have migrated from Maracajaú beach and have reached Pititinga beach (most southerly portion). Photo: Eduardo Q. de Lima.

Supporting Information I

SI.I - Geoindicators of vulnerability to coastal erosion.

Category	Weight	Geoindicator	Weight	Normalized Score	Indicator Attribute	Weight	Score
Shoreline	0.9	Erosion rate	0.3	0.27	Severe erosion	10	**2.7**
					Erosion	5	1.35
					Accretion	1	0.27
		Height of foredune	0.2	0.18	No dune	10	**1.8**
					Low (< 2 m)	5	0.9
					High (≥ 2 m)	1	0.18
		Condition of foredune	0.1	0.09	No dune	10	**0.9**
					Escarped	5	0.45
					No escarpments	1	0.09
		Type of foredune	0.1	0.09	No dune	10	**0.9**
					Altered	5	0.45
					Natural	1	0.09
		Wave energy	0.05	0.045	High (*HB > 2.5 m)	10	**0.45**
					Medium (1.5m < HB < 2.5m)	5	0.225
					Low (HB < 1.5 m)	1	0.045
		Vegetation of the foredune or backshore	0.1	0.09	Absent	10	**0.9**
					Present	5	0.45
					Established	1	0.09
		Medium width of the dry beach	0.1	0.09	< 11 m	10	**0.9**
					> 11 and < 18 m	5	0.45
					>18 m	1	0.09
		Engineering structures	0.05	0.045	Several	10	**0.45**
					Few	5	0.225
					Absent	1	0.045
Interior	0.1	Condition of the transgressive dune	1	0.1	Dune removed or absent	10	**1**
					Discontinuous with vegetation	5	0.5
					High, well developed	1	0.1

*HB – corresponds to wave height at the breaker zone/corresponde à altura da onda na arrebentação.

Supporting Information II

SI.II - Attributes to evaluate the geoindicator erosion rate.

Attributes of the geoindicator erosion rate
Severe erosion
– Dunes absent
– Vegetation absent
– Structures constructed by humans on the coast which are now on the backshore, foreshore, or shoreface.
– Evident escarpment of the beach
Erosion
– Dunes escarped or fragmented
– Turf, mud, or pieces of tree exposed on the beach.
– Narrow beach or absence of dry beach
– Ephemeral or felled vegetation along the escarpment line
– Exhumation of sandstone reefs and beachrocks
Long-term stability (accretion)
– Well developed dunes, without ruptures, with vegetation
– Wide beach with backshore well developed
– Well developed restinga vegetation in the interior, dune shrubs, and pioneer grasses

SI.III - Sinusoidal equation with fuzzy pertinence.

According to Burrough and McDonald (1998) and Rudorff (2005), the most frequently used functions of fuzzy association are the linear and sinusoidal ones. Thus, the following sinusoidal equation with fuzzy pertinence was used:

$$\alpha = \frac{1}{(Z_{0,5} - \beta)^2} \qquad (1)$$

$$f(Z) = \frac{1}{1 + (\alpha(Z - \beta)^2)} \qquad (2)$$

where $Z_{0,5}$ corresponds to the susceptibility potential 0.5 for a determined altitude, and β represents the maximum value of potential susceptibility, 1.0. For $Z_{0,5}$ it was randomly attributed to an altitude of 5m, while the maximum value of susceptibility potential β was defined as an altitude of 0m.