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TITLE: Reimagining South American coasts: unveiling the hidden invasion history of an iconic ecological engineer

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ABSTRACT:

Abstract Aim The smooth cordgrass *Spartina alterniflora* is an iconic ecological engineer that has inspired some of the more insightful concepts and perspectives in modern theoretical ecology and environmental management, from population to community and ecosystem scales. Although it is currently considered native over more than 100 degrees of latitude along the Atlantic coast of the Americas, we challenge the default assumption that this cordgrass is native to South America, and propose an alternative hypothesis that it was introduced in the 18th or early 19th century by human activity. **Location** World-wide. **Methods** We applied nine criteria that have been proposed for the recognition of non-native species. These criteria consider the historical, biological, geographic, dispersal, ecological and evolutionary evidence that classically underpin the distinctions between native and non-native species. **Results** Our results strongly support the hypothesis that *S. alterniflora* is not native to South America. Herbarium collections, historical floristic descriptions and extensive literature reports clearly indicate that *S. alterniflora* was absent prior to the early 1800s in South America. *S. alterniflora* shows a reduced morphological, ecological and physiological variability along the South American coast and demonstrably increased in both regional extent and abundance over the 20th century. **Main conclusions** We conclude that what are now extensive *S. alterniflora* marshes in this region were probably bare mudflats and that there have been vast unrecorded and thus overlooked shifts in bird, fish and invertebrate biodiversity, and immense shifts in algal vs. detritus production, with the concomitant trophic cascades that these changes imply. Our results change the way we perceive 'natural' coastal ecosystems on the Atlantic coast of South America as a whole. Indeed, most South American coastal marshes currently are what we term 'ecological mirages'—illusions that have seriously hampered our ability to recognize the nature of pre-existing native ecosystems.

SOURCE: Diversity and distributions

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