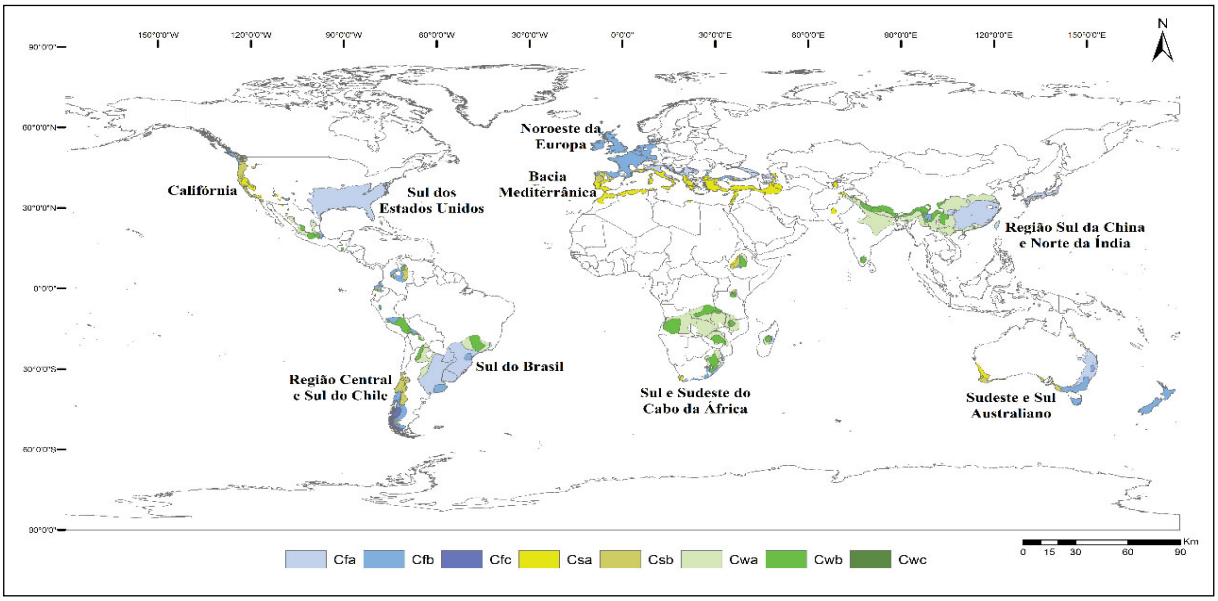
Australian *Acacia longifolia* invasibility: geographic, climate and taxonomic scales in invaded ranges

Jorge Luis P. Oliveira-Costa[1]
Rui Ferreira de Figueiredo[2]
Vânia Regina Pivello[3]

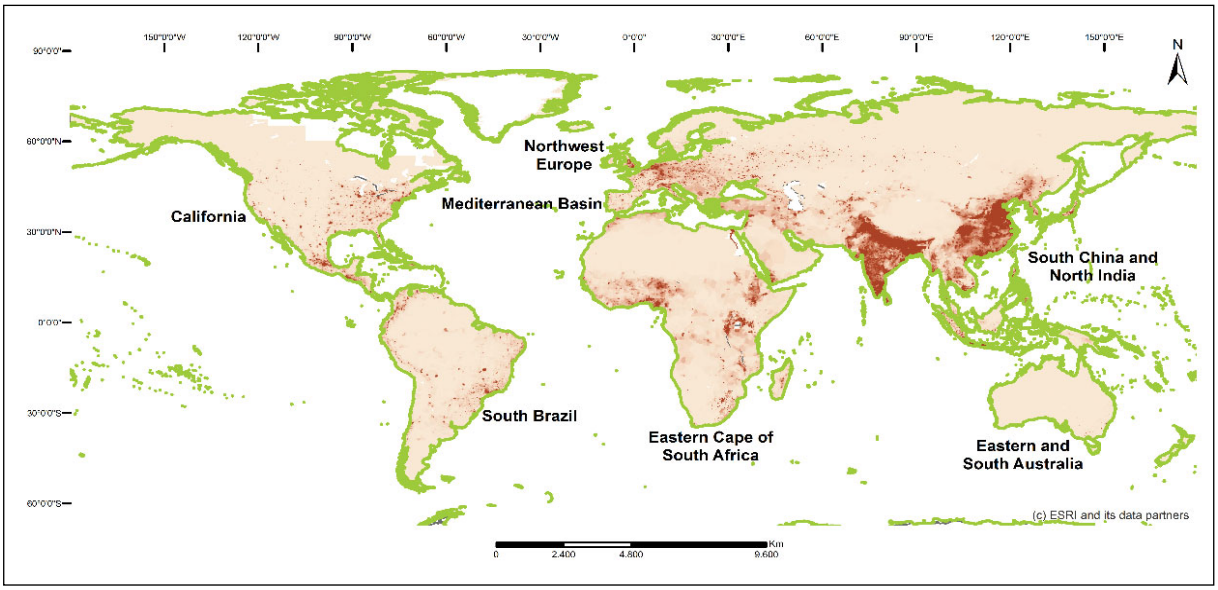
The notion of invasibility is crucial to understand biological invasions. Here, we propose three innovations to approach invasibility: shifting the focus from identifying changes in species biological behavior to the understanding of environmental dynamics; changing the approach from invasiveness to invasion susceptibility; and most importantly, changing the focus from patterns description to historical analysis.

There are noticeable environmental contrasts between eastward and westward continental coastlines, especially in the middle latitudes. In this belt, also known as 'temperate zone', we can find several different climate types (mediterranean, temperate, subtropical), and great contrasts between human voids (in inland areas), and regions with high population densities (mostly in coastal areas).

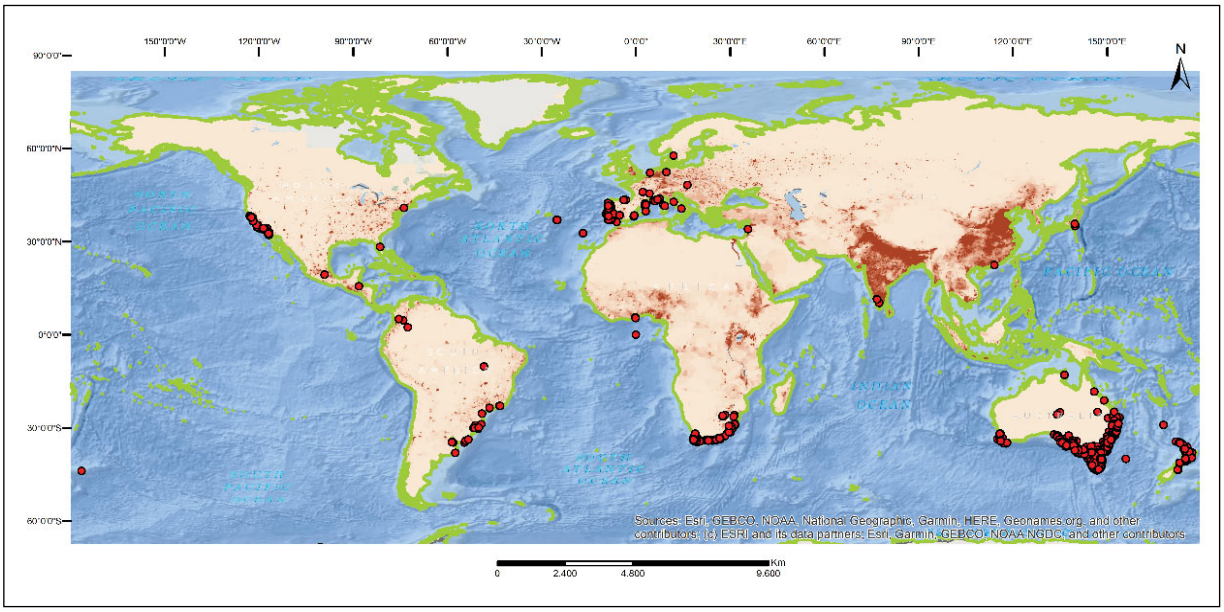


1 Doutorando em Geografia Física. Un. Coimbra. Portugal. Centro de Estudos de Geografia e Ordenamento do Território. Un. Coimbra. MSc em Geografia Física. E-mail: oliveiracostajorge@gmail.com
2 Departamento de Geografia e Turismo. Un. Coimbra. Portugal. Centro de Estudos de Geografia e Ordenamento do Território. Un. Coimbra. PhD em Geografia. E-mail: ruiff@ci.uc.pt
3 Instituto de Biociências. Un. São Paulo. Brasil. Departamento de Ecologia Geral. Un. São Paulo. PhD em Applied Ecology. E-mail: vrpivel@ib.usp.br

The latter are also traditionally characterized by intense regional and global movements of people and goods, and thus correspond to objects of prime importance in the study and understanding the major drivers in biological invasions.

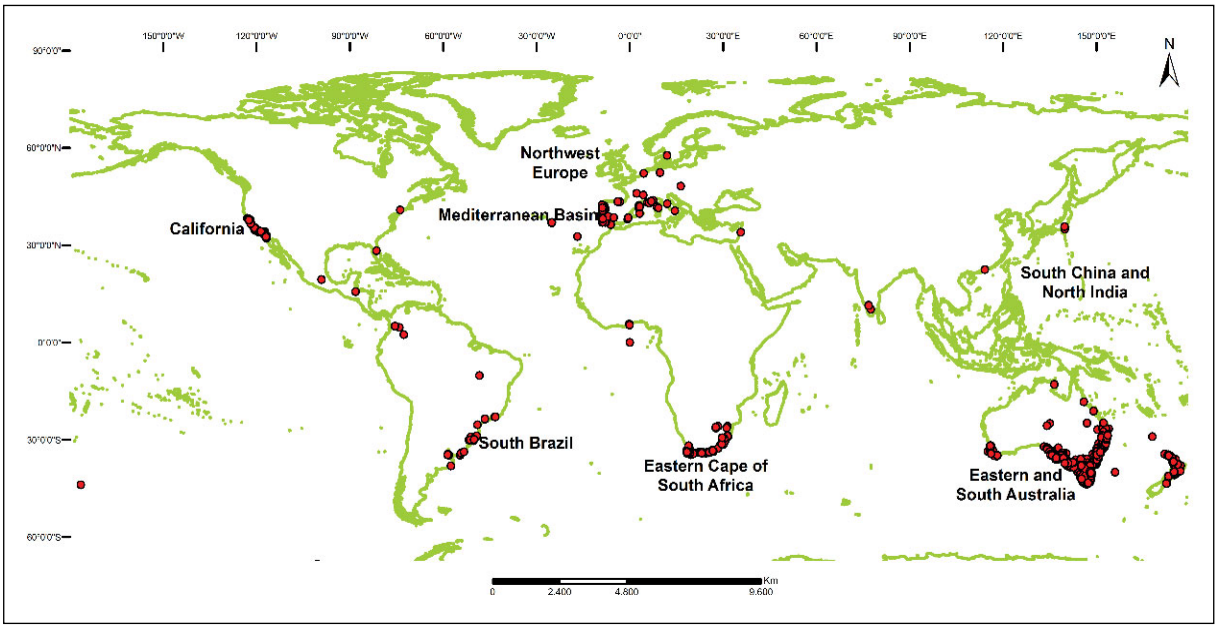


To comprehend the invasibility in these regions we need to go beyond the effects of the environment on biological invasions; it is necessary to include also the effects of organisms on the environment.



The Australian tree *Acacia longifolia* is a global invasive coastal species, and can be used as good model to provide new insights into the mechanisms that explain distribution patterns of non-native species in temperate regions. For example, the ability to outcompete

native species under dry and/or wet, stressful conditions in temperate regions provides *Acacia longifolia* a growth advantage that, over time, results in relatively high abundance in drier conditions and lower abundance in wetter conditions. *A. longifolia* may also alter its environment by consuming resources, suppressing native coastal species, or influencing ecosystem functioning.



Here we aim to review empirical evidences using data for *Acacia longifolia* to analyze the invasibility of coastal systems under three synthetic steps:
(i) Explaining the influence of geographic conditions in the invasibility levels at large spatial scales;
(ii) Correlating this knowledge with the dynamic of *A. longifolia* invasiveness in temperate regions;
(iii) Seeking to understand the coastline invasibility phenomenon, by using the *A. longifolia* as an empirical example for invasive species.

Keywords: Invasibility concept. Invasion ecology. *Acacia*. Plant distribution. Species diversity. Coastal systems. Temperate regions.