Translating the windows of opportunity theory into techniques to establish ecosystem-engineering species: linking theory to application

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Ecosystem engineers (EE) are species that are capable of modifying their physical environment. In estuarine and coastal environments EE are highly abundant, and are typically foundation species that provide habitat to many other species, thereby enhancing diversity. Unfortunately, these estuarine and coastal ecosystems 'engineered' by foundation species (seagrass, mangroves, salt marshes, oyster reefs, etc.) have been globally declining. Restoration of these ecosystem engineers has proven to be extremely difficult, with high failure of restoration efforts around the globe.

At the same time, the need for restoration is increasing, given the many ecosystems services that EE-ecosystems provide (e.g., enhance coastal defense, reduce coastal erosion, enhance biodiversity, etc). Hence, over the last years a large body of work has focused on how to restore EE-ecosystems. This has led to the Windows of Opportunity concept. Within this talk, I will highlight i) the Window of Opportunity theory and ii) how this theory has led to novel restoration techniques. I will specifically highlight the use of biodegradable elements (BESE) that can be used for coastal restoration.