

Beachfront nourishment decisions: The "sucker-free rider" problem

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Coastal communities and beachfront property owners often respond to erosion by adding sand to restore local beaches. But beach nourishment alters shoreline dynamics, not only at the replenishment site but also in adjacent coastal regions, as natural coastal processes shift sand from one location to another. The result is that "sucker" communities pay to build up their beaches, but that replenishment also helps protect the coastlines of "free rider" communities. The sucker-free rider situation is an example of a classic problem studied in economics and game theory frameworks.

Using [model simulations](#) of the dynamics of coastlines similar to those along much of the U.S. East Coast, coupled with a model of locally economically optimal nourishment decisions, Williams et al. find that interactions between the erosion processes and economic and physical feedbacks do tend to lead to the sucker-free rider situation. Large inequalities in property values can result, especially as the cost of sand for nourishment rises.

The results indicate that decentralized management of beach nourishment, in which individuals or communities make locally optimal decisions without taking into account the effects on others may lead to a use of resources that is not optimal over a wider area.

More information: Coupled Economic-Coastline Modeling with Suckers and Free Riders, *Journal of Geophysical Research-Earth Surface*, [doi: 10.1002/jgrf.20066](https://doi.org/10.1002/jgrf.20066), 2013

<http://onlinelibrary.wiley.com/doi/10.1002/jgrf.20066/abstract>

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