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TITLE: Future of our coasts: The potential for natural and hybrid infrastructure to enhance the resilience of our coastal communities, economies and ecosystems

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ABSTRACT:

There is substantial evidence that natural infrastructure (i.e., healthy ecosystems) and combinations of natural and built infrastructure (hybrid approaches) enhance coastal resilience by providing important storm and coastal flooding protection, while also providing other benefits. There is growing interest in the U.S., as well as around the world, to use natural infrastructure to help coastal communities become more resilient to extreme events and reduce the risk of coastal flooding. Here we highlight strengths and weaknesses of the coastal protection benefits provided by built infrastructure, natural ecosystems, and the innovative opportunities to combine the two into hybrid approaches for coastal protection. We also examine some case studies where hybrid approaches are being implemented to improve coastal resilience as well as some of the policy challenges that can make implementation of these approaches more difficult. The case studies we examine are largely in the U.S. but also include a couple of international examples as well. Based on this analysis, we conclude that coastal communities and other decision makers need better information in order to incorporate ecosystem protection and restoration into coastal resilience planning efforts. As additional projects are developed, it is important to capitalize on every opportunity to learn more about the cost of natural and hybrid infrastructure projects, the value of the storm and erosion protection benefits provided, and the full suite of co-benefits provided by healthy coastal ecosystems. We highlight top priorities for research, investment in, and application of natural and hybrid approaches. These data are critical to facilitate adoption of these approaches in planning and decision-making at all levels to enhance the resilience of our coasts.

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