Getting the best of both worlds in coastal protection?

[](http://coastalnewstoday.com/wp-content/uploads/2015/05/Sea-Wall-Wikimedia.jpg)

To protect your community’s coasts (and the valuable property and infrastructure behind them), what works better – a “built” system of hard structures, or a more natural system of coastal buffers?

According to a new study, the most resilient answer is a combination of both approaches – and, when it’s done right, your community can get the best of both worlds.

The study — “Future of our coasts: The potential for natural and hybrid infrastructure to enhance the resilience of our coastal communities, economies and ecosystems” by Ariana E. Sutton-Grier, Kateryna Wowk and Holly Bamford – was funded by the National Oceanic & Atmospheric Administration (NOAA) and published in “Environmental Science and Policy.” Using reports and peer-reviewed studies, the authors outline the strengths and weaknesses of “built” infrastructure (such as seawalls and dikes), natural approaches (such as salt marshes, reefs and plants) or a combination of the two.

Their findings?

* Built infrastructure has a lot of proven technology for its design and construction, but is not as adaptable to changing conditions, has a finite lifetime, can damage or destroy natural habitat and create a false sense of security for upland owners.
* Natural infrastructure provides significant day-to-day benefits as well as protection in smaller storms and the ability to recover post-storm. However, the technology is still evolving, the results can vary widely based on other conditions, a natural installation can take more space to provide reasonable protection and it can be more difficult to permit.
* The hybrid approach (a combination of built and natural), when properly designed and installed, can give your coast the best of both types: Natural protection for smaller storms with the ongoing benefits to the adjacent ecosystems, with a stronger and more “designed” solution as a backup in more significant storm events. In the right hands, a hybrid also allows for more custom design options to address and adapt to specific coastal needs.

“When making coastal protection decisions, it’s important to recognize that built infrastructure only provides benefits when storms are approaching, but natural and hybrid systems provide additional benefits, including opportunities for fishing and recreation, all the time,” said Ariana Sutton-Grier, Ph.D., the study’s lead author, faculty member at the University of Maryland and NOAA’s National Ocean Service ecosystem science adviser.

“Natural and hybrid systems can also improve water quality, provide habitat for many important species, and mitigate carbon going into our atmosphere.”

“There is a lot of potential innovation with hybrid approaches,” said Katya Wowk, Ph.D., NOAA senior social scientist, and a study co-author. “Hybrid approaches, using both built and natural infrastructure, often provide more cost-effective flood risk reduction options and alternatives for communities when there is not enough space to use natural coastal protection alone.”

Hybrid approaches, such as combining some habitat restoration with openable flood gates or removable flood walls, provide benefits while also providing more storm and erosion protection than natural approaches alone. The study highlights hybrid approaches in the New York City metro area and in Seoul, South Korea, to deal with their monsoon flooding events.

The study also identified additional research needed to better quantify this approach, which includes a more thorough analysis of the financial benefit of adequate storm protection, more understanding of how natural systems can provide storm protection in a variety of settings and storm conditions, and more work on integrating both approaches in an engineered but ecological response, among other efforts.

“There is no ‘one size fits all’ solution when it comes to what is best for a community in providing coastal protection from flooding,” said Holly Bamford, Ph.D., acting assistant secretary of commerce for conservation and management at NOAA, and a study co-author. “We all have to work to innovate, test, monitor, and develop a better suite of options that includes more natural and hybrid infrastructure alternatives for providing coastal protection to communities around the world.”

* A copy of the report is available online at: <http://www.sciencedirect.com/science/article/pii/S1462901115000799>

Press Release

13 may 2015