

COASTAL HABITATS DEFEND U.S. COMMUNITIES

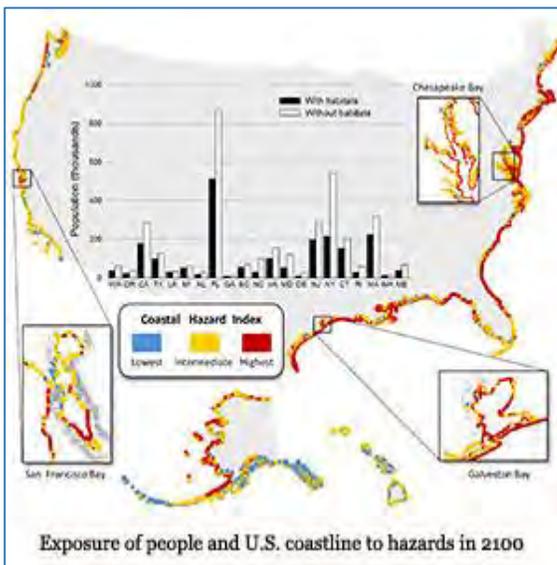


A new study by scientists at the Natural Capital Project and The Nature Conservancy investigates the role of coastal habitats in protecting U.S. residents and their property from extreme weather events and eroding coastlines.

Published in this issue of *Nature Climate Change*, "[Coastal habitats shield people and property from sea-level rise and storms](#)," is the first comprehensive analysis of where ecosystems provide a natural defense against coastal storms and climate-induced sea level rise along the entire U.S. coastline.

Led by ecologist Katie Arkema, the paper identifies where conservation and restoration of habitats, such as wetlands and reefs, could make the largest impact for people and property, with a focus on communities and infrastructure most vulnerable to damage from coastal hazards.

The paper's findings are relevant at a time when U.S. coastal planners are grappling to manage shorelines for rising sea levels, intensifying erosion, and storm events. The devastating and costly impacts of Hurricane Sandy highlight the need for such analyses to inform strategies for enhancing resilience of coastal communities to shoreline erosion and inundation. Arkema et. al present the first national map of risk-reduction due to coastal habitats, suggesting areas where investing in coastal ecosystems is a critical component of coastal defense and climate adaptation planning.



METHODS

The modeling approach used in Arkema et. al synthesizes existing hazard models, climate scenarios, demographic and economic information, and ecological data to identify where habitats may contribute to protection from coastal hazards.

The team compiled a nationwide map of the major coastal habitats and analyzed them under five sea level rise scenarios and two habitat scenarios (with and without habitat). To identify portions of the shoreline with the greatest potential to mitigate risk, the team created a hazard index for every square kilometer of the United States coastline.

[View the interactive map.](#)

Results suggest that the number of people and total value of residential property most exposed to hazards can be reduced by half by the end of the century if existing coastal habitats remain fully intact. Coastal habitats defend the greatest number of people and total property value in Florida, New York, and California.

INVESTING IN SOLUTIONS

The approach presented in Arkema et. al can help target regions for investment in coastal habitat protection and restoration. The new data will be especially useful at state and county levels, in places such as Pinellas, Hillsborough and Monroe Counties in Florida and Kings County in New York, which are fringed by natural defenses that play critical protective roles.

Identifying the best locations to invest in ecosystem-based strategies for coastal protection can also reveal where other critical services of habitats are provided. Peter Kareiva, chief scientist at TNC and a co-author on the paper, described the importance of preserving these multiple benefits, saying, "This study helps us identify those places and opportunities we have to keep nature protecting our coastal communities — and giving us all the other benefits it can provide, such as recreation, fish nurseries, water filtration and erosion control."



FUTURE WORK

NatCap is working with local partners in regions around the U.S. to apply the approach in Arkema et. al on finer scales using local data. We have completed analyses for the entire Gulf coast and are about to embark on regional analyses for the Northeast. The results are currently being incorporated into TNC's coastal resilience program and decision-support tools, and may also be used to inform allocation of funding for habitat restoration through [RESTORE](#) legislation and post-Sandy planning.

NEWS

[Dunes, reefs protect U.S. coasts from climate change](#)

by Wendy Koch | USA Today | July 14th, 2013

Rising sea levels and extreme weather put 16% of U.S. coastlines at "high-hazard" risk and the number of threatened residents could double if natural habitats — sand dunes, coral reefs, sea grasses, mangroves — aren't protected, Stanford University researchers say in a study today.

[An Eco-Friendly Solution to Coastal Hazards](#)

by Eliana Dockterman | TIME | July 15th, 2013

In the wake of Superstorm Sandy, a study suggests that conservation can protect potential storm victims. Unfortunately for America's coastal cities, Superstorm Sandy was not an aberration. The storm that left so many Northeasterners stranded in flooded homes without electricity was just the first of many to be expected as sea levels continue to rise due to climate change. Cities are constructing plans to protect themselves from future storms — Mayor Michael Bloomberg released his strategy for New York City to the tune of \$20 billion this month — scientists, engineers and politicians are seeking out innovative ways to protect our coastlines. A new study suggests that conservation of our ecosystems may be the answer.

New Map Shows Where Nature Protects U.S. Coast

by Brian Handwek | National Geographic | July 14th, 2013

Real estate is all about location, and coastal reefs and wetlands now look like especially attractive neighbors. Americans looking to buy seaside property would do well to study the first-ever nationwide map showing how and where natural habitats like reefs and vegetation best protect coastal residents from rising seas and catastrophic storms like last year's Hurricane Sandy.

Natural defences can sharply limit coastal damage

by Virginia Gewin | NATURE News | July 14th, 2013

Reefs, dunes and marshes are key to protecting lives and property against storm surges and long-term sea-level rise. Coastal forests, coral reefs, sand dunes and wetlands are just a few of the natural habitats that protect two-thirds of the US coastline from hazards such as hurricane storm surges — shielding not only high-value properties in New York and California but also the poor in Texas and the elderly in Florida.

Saving coastal habitats may help cut cost of storm damage

by David Perlman | San Francisco Chronicle | July 14th, 2013

Floods and violent storms along America's coasts will cost billions in lost homes and threaten countless people as sea levels continue rising, but saving natural barriers like sand dunes, coastal bluffs and even kelp forests could cut those losses by half, a Stanford-based study maintains.

How the Bay's Natural Buffers Can Help Defend Us From Sea Level Rise

Read or Listen

blog by Molly Samuel, on-air interview by Stephanie Martin | KQED / NPR | July 16th, 2013

When it comes to protecting people and property from rising sea levels and catastrophic storms, it turns out that nature can often provide a better solution than an expensive engineering project.

Unexpected ally against future hurricanes: nature?

by Liz Fuller-Wright | The Christian Science Monitor | July 15th, 2013

Mother Nature might provide the best defense against rising sea levels and ever-larger hurricane storm surges, says a new study published in this week's "Nature: Climate Change."

Losing natural buffers could double the number of people exposed to hurricanes

by Evan Lehmann | ClimateWire | July 15th, 2013

If the United States lost its shield of natural coastal defenses, about twice as many Americans would be exposed to dangerous storm surges and other hurricane threats, according to new research. Protective buffers like mangroves, wetlands and oyster beds currently buffer about 67 percent of the nation's seashores from ocean forces like wind and waves. If they disappear, more than a million

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Coastal habitats shield people and property from sea-level rise and storms

HIGHLIGHTS

Roughly 16% of the U.S. coastline (within 1 kilometer of the shore) is in “high hazard” areas—home to 1.3 million people and \$300 billion in residential property.

By 2100, expected sea level rise will increase the amount of highly threatened people and property by 30-60%.

67% of the U.S. coastline is protected by natural habitat. If lost, the number of poor and elderly people and the total property value in the areas at highest risk from coastal hazards would double.

INPUT DATA SOURCES

Summary of Arkema et al.
[Input Data Sources](#)

additional people and billions of dollars in property value will be vulnerable to damage, says a paper published yesterday in the journal Nature Climate Change.

New Study: Coastal Nature Reduces Risk from Storm Impacts for 1.3 Million U.S. Residents

by Bob Lalasz | TNC Cool Green Science | July 15th, 2013

Katrina, Sandy, Andrew: iconic names....and indelible examples of how nature can kill and destroy. But could nature actually help reduce our risk from...nature? Specifically: could sand dunes, oyster and coral reefs, sea grasses and other coastal natural habitats blunt the effects of coastal storms — like surges and flooding? Could they even reduce the risk of fatalities and property loss from such storms? They already are — for at least 1.3 million people and billions in property value along the U.S. coastline, according to a new study just published in the journal Nature Climate Change. Neglecting those habitats, the study adds, could double the number of U.S. residents at "high hazard risk" from storms — including hundreds of thousands of poor and elderly.

Reefs and Dunes Play Critical Roles in safeguarding Lives in US Coastal Regions

by Bruce Totolos | French Tribune | July 15th, 2013

When rising sea levels and excessive weather conditions have already put 16% of U. S. coastlines at "high-hazard" risk; in a recent study carried out by researchers of Stanford University it has been found that if natural habitats like sand dunes, sea grasses, coral reefs, and mangroves aren't protected, it would threatened twice the number of residents here.

Newly Released Study Reinforces How Nature Defends US Coastlines Against Storm Catastrophes

PRWeb | July 15th, 2013

A new study by scientists at the Natural Capital Project says that natural habitats are critical to protecting millions of U.S. residents and their property from devastation by coastal storms. And neglecting those habitats, say the study's authors, could double the amount of people at "high-hazard" risk, including hundreds of thousands of poor and elderly.

The Best Defense Against Catastrophic Storms: Mother Nature

by Elizabeth Rauer | Stanford News | July 15th, 2013

Natural habitats such as dunes and reefs are critical to protecting millions of U.S. residents and billions of dollars in property from coastal storms, according to a new study by scientists with the Natural Capital Project at the Stanford Woods Institute for the Environment. The study, published in the journal Nature Climate Change, offers the first comprehensive map of the entire U.S. coastline that shows where and how much protection communities get from natural habitats such as sand dunes, coral reefs, sea grasses and mangroves.

New Study: How Nature Defends US Coastlines Against Storm Catastrophes

Press Release | July 14th, 2013

Extreme weather, sea-level rise and degraded coastal ecosystems are placing people and property at greater risk of damage from coastal storms. The likelihood and magnitude of losses may be reduced by intact coastal ecosystems near vulnerable coastal communities.

PUBLICATION

Coastal habitats shield people and property from sea-level rise and storms

Arkema, Katie K., Greg Guannel, Gregory Verutes, Spencer A. Wood, Anne Guerry, Mary Ruckelshaus, Peter Kareiva, Martin Lacayo and Jessica M. Silver

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