



## Key Points

- Coastal wetlands prevented \$625 million in property damages during Hurricane Sandy. They can reduce annual storm damages by more than 20%.
- The protection benefits of wetlands can be incorporated into insurance models.
- This analysis monetizes the coastal protection benefits of wetlands, and informs incentives for wetland conservation, including risk assessments, infrastructure spending priorities, insurance premiums, and resilience bonds.

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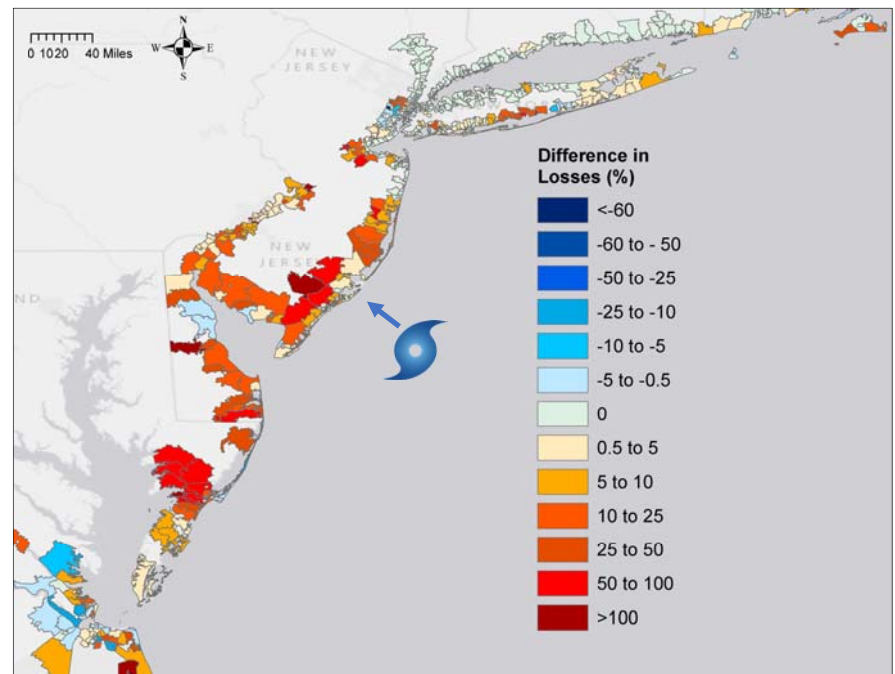
## The Value of Coastal Wetlands for Reducing Property Damage

A new report quantifies the ability of coastal wetlands to protect people and property from flooding

Coastal development and climate change are increasing the risks to people and property from flooding and storm surge. In the past 10 years, insurers have paid out more than US\$200 billion for coastal damages from storms globally. Coastal wetlands act as natural defenses that protect coastlines by slowing waves and reducing flooding.

In a new report, a team of scientists from the conservation, engineering and insurance sectors quantify the direct connections between coastal wetlands and property damage from Hurricane Sandy and other storms. The report - "Coastal Wetlands and Flood Damage Reduction: Using Risk Industry-based Models to Assess Natural Defenses in the Northeastern US" - identifies the protective role of coastal wetlands as natural defenses that reduce property damages.

The report shows that coastal wetlands prevented US\$625 million in flood damages to private property during Hurricane Sandy. In New Jersey alone, wetlands saved more than US\$425 million in property damages. In Maryland, wetlands reduced damages by 29%. Wetlands throughout the northeast US reduced damages by more than 10% during Hurricane Sandy. (See map on right.)



### Coastal Wetlands Protected People and Property During Hurricane Sandy

Census tracts show the percent change in flood damages that would have occurred during Hurricane Sandy if our coastal wetlands were lost. Dark red areas receive the greatest protection benefits from coastal wetlands.



Find the report at  
[www.lloyds.com/coastalresilience](http://www.lloyds.com/coastalresilience)



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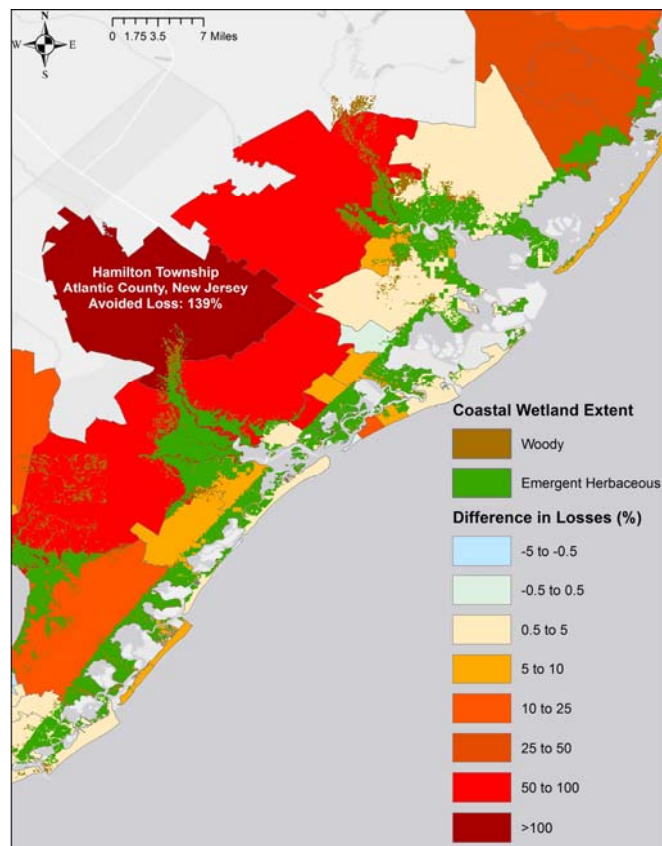
Wetlands provide benefits from more frequent storms as well. In Ocean County, New Jersey, the research shows that conserving wetlands reduces annual property damage by 20%, and that properties built over previously existing wetlands face the greatest risks.

The benefits of wetland conservation can accumulate upstream. Towns with few wetlands within their borders received many benefits from wetlands conserved by municipalities downstream. (See map on right).

Integrating the value of coastal wetlands into risk management has been challenging because of the difficulty of quantifying their economic benefits. This ground-breaking research shows that we can measure the value of these natural defenses and include them effectively in insurance industry risk models. In fact, the protection provided by coastal wetlands is often included in industry risk models, but these effects are pooled with many other factors and thus not clearly recognized by model users and decision makers.

Wetlands have been lost at alarming rates across the northeastern United States. New York alone has lost 50% of its wetlands on Long Island Sound during the past 130 years. This research provides clear incentives for the conservation of these natural defenses. If these highly adaptive ecosystems are managed well, they can keep pace with sea level rise and changing environmental conditions, and provide cost effective risk reduction and coastal protection.

The research also suggests implications for government policy. Investment in natural infrastructure is a cost-effective strategy for protecting communities and building resilience.



**The effects of wetlands on flood damage reduction in Atlantic County, New Jersey**

Hamilton Township contains very few wetlands, but benefits from the cumulative effects of wetlands further down the estuary.

This research was led by the University of California Santa Cruz, The Nature Conservancy, and the Wildlife Conservation Society, in association with Risk Management Solutions and Guy Carpenter and Company. The Project was supported by the Lloyd's Tercentenary Research Foundation with additional support from the Science for Nature and People Partnership (SNAPP).

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