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How Dutch innovations could prevent Sandy-type flooding in New York

City architects and officials have been trying to find ways to protect the city from another storm of Sandy's magnitude.
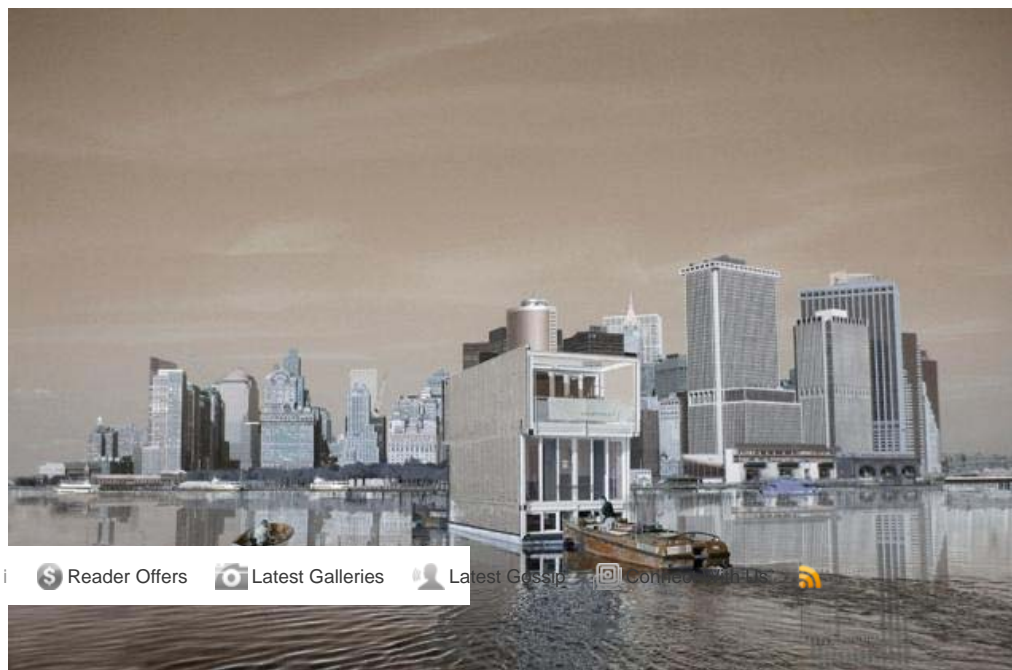
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HAIKO CORNELISSEN

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Jackson Heights-based architect Haiko Cornelissen grew up below sea level in Amsterdam. He took note as his country employed flood-prevention measures in harbors, along the coastline and in various housing styles constructed specifically to survive water disasters.

How can we prevent this from happening again?

That's the question on the lips of those from New York's hardest-hit streets. City architects and officials have been trying to answer that question and consider ways to protect New York

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from another storm of Sandy's magnitude since her waters received.

"Rather than looking to short-term housing solutions, consider long-term/permanent housing solutions to reduce the number of moves and disruptions to lives of families," says Michelle Whetten, VP & market leader, Gulf Coast, Enterprise Community Partners.

Stephen M. Sweeney, president of the New Jersey Senate, agrees: "We just can't rebuild it the way it was. The worst thing to do is to have this experience and not learn from it."

Architect Haiko Cornelissen.

In addition to preparing for future storms with hurricane kits and home generators, we can look to nations like the Netherlands, which has experienced deadly floods for eight centuries, for innovative solutions.

RELATED: After Sandy's destruction, real estate titans contemplate whether downtown market can remain viable and what should be done to curb the flood threat

Jackson Heights-based architect Haiko Cornelissen grew up below sea level in Amsterdam. He took note as his country employed flood-prevention measures in harbors, along the coastline and in various housing styles constructed specifically to survive water disasters.

Acting fast after Sandy, Cornelissen has set up the website NL4US.com, which offers safe and sustainable solutions for rebuilding in flood-prone areas in the United States.

Concepts including amphibious houses and anti-flood systems around bridges are described in detail. Speaking to engineers in his home country, the architect considered cost, time, building codes and location before lending his thoughts.

"We've experienced flooding in the Netherlands for centuries," says Cornelissen, whose Queens apartment was recently highlighted by the Guggenheim Museum in a tour of local homes. "The ideas are here for New York, but the themes also can help in New Orleans, Florida and the West Coast such as Seattle and San Francisco. This is a platform for solutions."

The estimated cost of some of the systems he suggests for protecting the harbor are upward of $6 billion per feature, but that figure could be a fraction of future damages.

"The total cost of the storm could be as high as $30 billion. To secure New York Harbor and certain waterways could cost $18 billion or so," says Cornelissen, who has worked for top global architects Rem Koolhaus and Steven Holl.

Here's how some of those Dutch innovations would look around Manhattan with explanations on how each would work in a future flood.

1. Amphibious Houses *(shown in top rendering)*
"This type of house looks and acts like any other typical house, except in times of flooding, says Cornelissen. "When the area floods, the amphibious house floats on the water, held in place by guides, and continues to function thanks to the flexible utilities. The amphibious house is more a new type of construction than a new type of house."

Add solar energy, says Cornelissen, and the amphibious house can operate off the grid, or on its own even in power outages.

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A rendering of Battery Park with floating homes.

2. Floating Houses in Battery Park

According to Cornelissen, the "floating communities in Amsterdam activate the waterfront with
prime location apartments that have the most amazing views in the city while they remain safe from
flooding." Here, they placed the floating houses built in Amsterdam near Battery Park to
demonstrate how the concept might work locally.

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A rendering of barriers under the Verranzano-Narrows bridge.

3. Verrazano-Narrows Bridge and New York City Harbor flood prevention

Experts and politicians including Gov. Cuomo recently agreed that bold steps are needed to protect the city from flooding in the future.

The Dutch government took a bold step in the 1950s to preserve the Netherlands' southern end with an unprecedented flood protecting infrastructure called Delta Works.

Based on the Dutch example, the Storm Surge Research Group at Stony Brook recommended in 2004 to use a similar solution with movable barriers around the New York Harbor, including under the Verrazano-Narrows Bridge.

"Thinking along these lines, I combined the Verrazano with the Maeslantkering, a barrier that protects Rotterdam, the busiest harbor of Europe," Cornelissen says. "The Maeslantkering completed the Delta Works after four decades of building the complete flood-protection infrastructure. The area has not flooded since.

"While the Bloomberg administration has aggressively promoted waterfront development in the city, the New York waterfronts are now the areas hit hardest by the recent storms," says the architect.

"Therefore one alternative to promote waterfront development is to use floating houses as seen in new parts of Amsterdam."

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