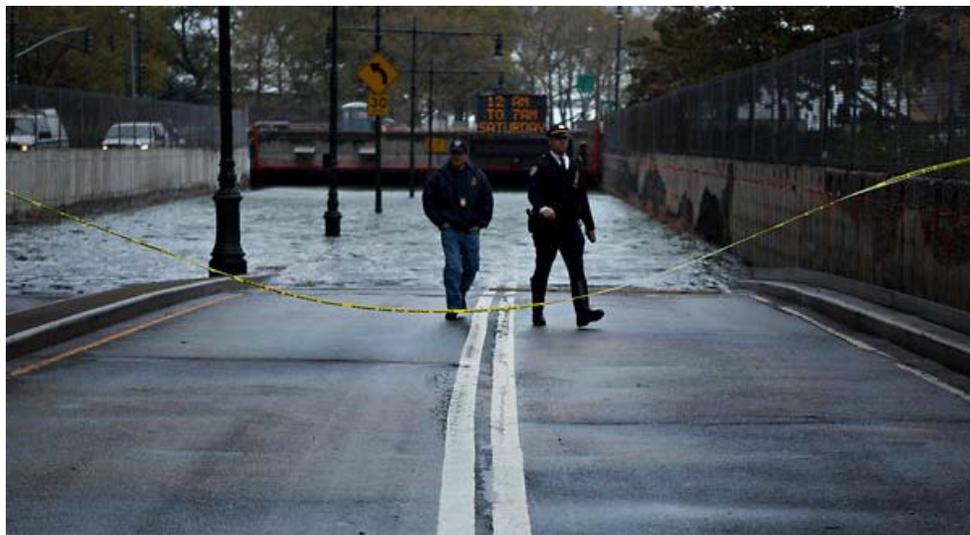


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## For Years, Warnings That It Could Happen Here



Damon Winter/The New York Times

The flooded entrance to the tunnel leading to the Franklin D. Roosevelt Drive in Lower Manhattan after the storm on Tuesday. [More Photos](#)

By DAVID W. CHEN and MIREYA NAVARRO  
Published: October 30, 2012 | 220 Comments

The [warnings came](#), again and again.

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For nearly a decade, scientists have told city and state officials that New York faces certain peril: rising sea levels, more frequent flooding and extreme weather patterns. The alarm bells grew louder after Tropical Storm Irene last year, when the city shut down its subway system and water rushed into the Rockaways and Lower Manhattan.

On Tuesday, as New Yorkers woke up to submerged neighborhoods and water-soaked electrical equipment, officials took their first tentative steps toward considering major infrastructure changes that could protect the city's fragile shores and eight million residents from repeated disastrous damage.

Gov. [Andrew M. Cuomo](#) said the state should consider a levee system or storm surge barriers and face up to the

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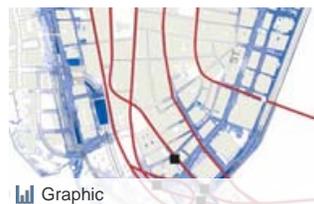
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inadequacy of the existing protections.

"The construction of this city did not anticipate these kinds of situations. We are only a few feet above sea level," Mr. Cuomo said during a radio interview. "As soon as you breach the sides of Manhattan, you now have a whole infrastructure under the city that fills — the subway system, the foundations for buildings," and the World Trade Center site.

The Cuomo administration plans talks with city and federal officials about how to proceed. The task could be daunting, given fiscal realities: storm surge barriers, the huge sea gates that some scientists say would be the best protection against floods, could cost as much as \$10 billion.

But many experts say, given what happened with the latest storm, that inertia could be more expensive.

After rising roughly an inch per decade in the last century, coastal waters in New York are expected to climb as fast as six inches per decade, or two feet by midcentury, according to a city-appointed scientific panel. That much more water means the city's flood risk zones could expand in size.

"Look, the city is extremely vulnerable to damaging storm surges just for its geography, and climate change is increasing that risk," said Ben Strauss, director of the sea level rise program at the research group [Climate Central](#) in Princeton, N.J. "Three of the top 10 highest floods at the Battery since 1900 happened in the last two and a half years. If that's not a wake-up call to take this seriously, I don't know what is."

With an almost eerie foreshadowing, the dangers laid out by scientists as they tried to press public officials for change in recent years describes what happened this week: Subway tunnels filled with water, just as they warned. Tens of thousands of people in Manhattan lost power. The city shut down.

What scientists, who have devoted years of research to the subject, now fear most is that, as soon as the cleanup from this storm is over, the public will move on.

Mayor Michael R. Bloomberg is known worldwide for his broad environmental vision. But one former official said it had been difficult to move from theoretical planning to

concrete actions, and it was hoped that the storm this week would change that.

"A fair question to ask is, have we been as focused as we need to be for emergency preparations," said the former official, who spoke on condition of anonymity so as not to jeopardize ties to the administration. "We've just been lucky. We need hardening for the risk we've always faced. Until things happen, people aren't willing to pay for it."



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A state report on rising sea levels, issued on the last day of Gov. David A. Paterson's administration in 2010, suggested that erecting structural barriers to restrain floodwaters could be part of a broader approach, along with relocating buildings and people farther from the coasts.

Mr. Bloomberg, during a briefing Tuesday, said he was consumed now with the urgent task of getting the city going again, and it was too soon to determine what steps should be taken.

Storm surge barriers represent the most dramatic potential change. They have been installed in Europe and some American cities and are designed to close during a storm to block surging waters from reaching shore.

Under a proposal put forth by the [Storm Surge Research Group](#) at Stony Brook University in 2004, large portions of the city could be protected by three movable barriers installed at the upper end of the East River near the Throgs Neck Bridge, under the Verrazano-Narrows Bridge and at the mouth of the Arthur Kill between Staten Island and New Jersey.

Still, some experts consider the barriers a last resort, and urge more modest changes, including subway floodgates. Task forces convened by the city and state have pushed to make the Metropolitan Transportation Authority and Consolidated Edison systems more resistant to storm damage. Some of that work is under way: After a deluge paralyzed the subways for several hours in 2007, the transit agency spent \$34 million on some flood protections. No additional state money has been forthcoming for an overhaul.

[Robert Puentes](#) of the Brookings Institution said that the city, to its credit, had developed a coastal storm plan that treated seriously the city's susceptibility, given its 520-mile coastline. But he said that "most of that focuses on mapping a response to the disaster after it already occurs."

A version of this article appeared in print on October 31, 2012, on page A1 of the New York edition with the headline: For Years, Warnings That It Could Happen Here.

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