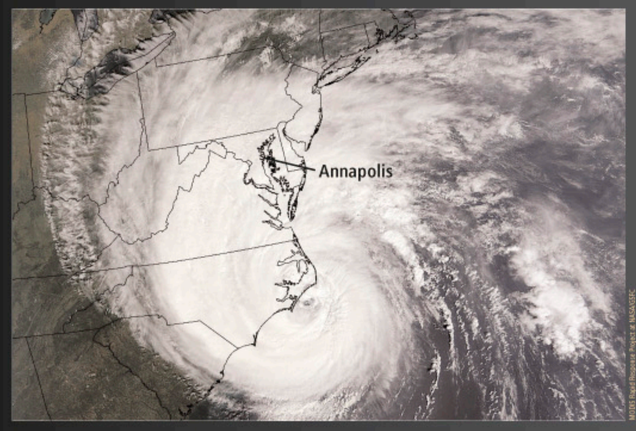
On Thursday, September 18, 2003

Hurricane Isabel,

a massive Category-2 storm, slammed into the east coast.



MODIS Rapid Response Project at NASA/GSFC

With its eye located just south of the Chesapeake Bay, Isabel's high winds and tidal surge caused widespread flooding, property damage and power outages from North Carolina to New York.

Downgraded to a tropical storm by the time it hit the Chesapeake, Isabel's winds nevertheless drove water and waves up the Bay, inundating roads, homes and businesses. The impact of the storm caught everyone—even many experts—by surprise.

Why did Isabel cause more damage than the typical tropical storm? Rising sea levels may be partly to blame. In the Chesapeake Bay, the rate of sea level rise is nearly twice the global average. If this continues, the region—already prone to coastal hazards, especially flooding and erosion—may become more and more vulnerable to storms like Isabel.

Hurricanes, tropical storms, nor'easters, floods and storm surges are natural events. They become disasters only when people, property and resources are put at risk.

If Isabel left devastation in its wake, the storm also taught us valuable lessons about how to prepare for these events—and where and how to build along the coast. In addition, Hurricane Isabel reminded us that our rapidly changing shores and waters demand that we act now to be ready for what risks the future might bring.

AP/Wide World Photos

City dock, downtown Annapolis

ANNAPOLIS

G. Nick Lundblom, The Capital

Main and Randall Streets

G. Nick Lundblom, The Capital

Annapolis Marriott, Compromise Street

G. Nick Lundblom, The Capital

City dock

Annapolis Maritime Museum

Eyewitness

Jeff Holland, Director, Annapolis Maritime Museum (formerly McNasby Oyster Company) Eastport

"YOU COULDN'T HAVE PICKED A BETTER PLACE to get slammed by a nor'easter. What we didn't anticipate was a storm surge that was 8.3 feet over the mean low tide. But it wasn't just the surge: We're at the mouth of Back Creek where the fetch crossed the Chesapeake Bay in such a way that the wind built up waves on top of the storm surge. That's why this structure was more damaged than any other in Annapolis—because of its northeastern exposure.

Annapolis Maritime Museum

There were actually waves crashing over the top of the building, and pilings as large as telephone poles were acting as battering rams. As they came in the wave, they got rammed into the side of the building.

I came over at midnight, which, according to the tide charts, was high tide. I let myself in the building and there was water armpit high, and the wave action was bulging against the double doors like a cold-rinse washing-machine cycle. I waded towards a door on the opposite side and tried to open it, but I couldn't. And then I heard this hissing sound.

So I went home. And about two hours later I was called by a neighbor who said, 'The police are here and the fire department's here. There are two large propane tanks floating down the street. I think they're yours!' Well, that hissing sound I heard? It was the propane tanks spewing out live propane. Not a darn thing you could do about it. Just wait until it dissipated and hope they didn't blow up.

Came back the next morning, which was supposed to be low tide. If you look down the street [behind you] where that stop sign is? That's where the water came up to. And at that point the water was actually higher than it was at midnight—about 8 feet!

If another Isabel comes along, we'll have to face it. You'd have to raze this building and build something that was up on eight-foot stilts to mitigate against that level of storm. What we will do is preserve this very historic building. And if there is an act of God that destroys it, then we'll have to live with that."

"We may leave some of the big holes to show that this is what nature does, this is what happened—and this can happen again."

"We didn't anticipate the water lifting up the entire dock, smashing it into the building, and dropping it in the street."

Annapolis Maritime Museum

WIND & WAVES

Wind and waves make a dynamic duo. Add to the mix sea level rise and an increasingly populated and developed coastline—and you have a recipe for disaster when a big storm strikes.

National Oceanic and Atmospheric Administration

Rising sea levels generate larger waves that break closer to shore, gradually eroding and inundating coastal areas. Periodic wind-driven storm tides compound these effects, causing sudden and significant changes to the coast that leave it more vulnerable to flooding and erosion.

During a hurricane, tropical storm or nor'easter, low pressure and high winds swirling around the eye create a large, wide (often 50 to 100 miles) dome of water, or *storm surge*, topped by wind-whipped waves. Stronger winds and shallower offshore waters mean a higher and more dangerous surge.

The storm surge combines with the normal tide, producing an elevated *storm tide*. If the surge comes at high tide, the greater the likelihood of severe coastal flooding. The actual impact of the storm will depend on its path, its size and how fast it is moving.

Storm surges pose a serious threat to low-lying coastal areas. When we build at the water's edge, we risk exposure to potentially hazardous conditions and costly loss.

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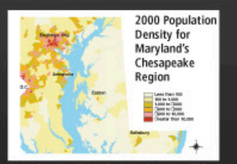
With the population around the Chesapeake expected to reach 19 million by 2030, development pressure on the Bay's vulnerable shoreline will increase tremendously—and along with climate change, we face an increase in the frequency and intensity of "natural disasters."

What options do we have? Our best defense is appropriate planning that identifies potential coastal hazards. By minimizing exposure and maximizing protection through sound land use and shoreline management, those who live and work around the Bay will be less vulnerable to the inevitable forces of wind and waves.



Maryland Department of Planning, Planning Data Services from 2000 Census

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